FREEPORT-McMoRan
OIL & GAS

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, CA 93455

Telephone: 805-934-8200

November 17, 2014

Jared Blumenfeld
U. S. EPA, Region 9
Attn: ENF4-1, NPDES/DMR
75 Hawthorne Street
San Francisco, CA 94105-3901

Re: Discharge Monitoring Report - Platform Hermosa NPDES Permit CAG280000

Dear Mr. Blumenfeld:

This letter and its attachments represent the Discharge Monitoring Report (DMR) for the months of August, September, and October 2014 for Platform Hermosa.

Included herein are the following attachments:

Attachment 1 is comprised of the EPA DMR forms 3320-1.

Attachment 2 is a listing of the chemical inventory for miscellaneous discharges (specifically non-contact cooling and fire water) as required by II.F. of the subject permit.

Attachment 3 are the undissociated sulfide conversion calculation tables in accordance with II.B.1.a. of the permit.

Attachment 4 provides required pre-dilution and post-dilution chlorine results for non-contact cooling and fire water discharges in accordance with Appendix C of the permit.

Attachment 5 summarizes miscellaneous sampling results for extra testing we initiated. These results are included since the results were derived by an EPA approved test method, in accordance with Part III.D. of the permit.

Attachment 6 includes copies of the official state certified lab reports for O & G and miscellaneous NPDES monitoring. Also included are the laboratory quality control reports for the lab reports, Chronic Whole Effluent Toxicity (WET) Testing performed in

August on red abalone, giant kelp, and topsmelt and other required information (MLs, MDLs, EPA Methods, chains-of-custody, sample dates, etc.).

Attachment 7 includes a copy of a letter previously sent to EPA.

The following is a brief summary of some of the monitoring and reporting parameters affecting the various discharges

Produced Water (Discharge 002):

A dilution ratio of 2148:1 was derived using the average flow rate from the previous quarter, as defined in Part V of the permit. This dilution was applied to the quarterly testing results and the numeric values reported in the DMR are post dilution values for comparison to the permit limits listed in the permit under Appendix B.

Due to an upset in the produced water system on September 18, 2014, an oil and grease sample received a lab value of 64 mg/l which exceeds the Daily Maximum Limit of 42 mg/l. The monthly average for September was within the permit limits, and there were no O & G exceedances during the months of August and October. It has been concluded that no endangerment to health or the environment was associated with the above occurrence.

Well Treatment, Completion and Workover Fluids (Discharge 003):

There were no well treatment, completion and workover fluid jobs performed during this quarter.

Non-Contact Cooling Water and Fire Water (Discharge 008 and 009):

Small amounts of chlorine are used to prevent internal bio-fouling within the piping in the non-contact cooling water and fire water systems on the platform. Attachment 4 summarizes the official quarterly chlorine result including post dilution and end of pipe results.

The quarterly testing results and the numeric values for chlorine reported in the DMR are post dilution values for comparison to the permit limits listed in Appendix C of the NPDES permit.

The majority of the fire water that is discharged occurs during short fire water pump tests. Separate EPA Plumes UM dilution models were run on the fire water and the non-contact cooling water systems and have been applied to the post dilution values reported in the DMR.

FM O&G uses an independent contractor to collect NPDES compliance monitoring samples at our offshore platforms. EPA protocols for sampling, preservation and documentation are strict requirements of our monitoring program.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C & 1001 and 33 U.S.C. & 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years)

If you should have any questions or require additional information, please contact me at (805) 934-8220.

Sincerely,

David Rose
Manager, Environmental, Health & Safety

Attachment(s)

cc: Regional Supervisor, Bureau of Ocean Energy Management
Alison Dettmer, California Coastal Commission
Regional Supervisor, Bureau of Safety Environmental Enforcement
Platform Hermosa Foremen

Platform Hermosa

Attachment 1

EPA DMR
PERMIT NO. CAG280000

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

No Discharge [X]

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
	YR	MO	DAY	YR	MO	DAY
From:	14	08	01	To: 14	10	31

DRILLING FLUIDS AND DRILL CUTTINGS (001)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
DRILLING FLUIDS VOLUME Well # N / A August	Sample Measurement		No Discharge	Barrels/ Well							
	Permit Requirement		Report							1/well 1/day	Estimate
Well # N / A September	Sample Measurement		No Discharge	Barrels/ Well							
	Permit Requirement		Report							1/well 1/day	Estimate
Well # N / A October	Sample Measurement		No Discharge	Barrels/ Well							
	Permit Requirement		Report							1/well 1/day	Estimate
Well # N / A Quarterly Total 08/01/14 - 10/31/14	Sample Measurement		0	Barrels/ Quarter					0		
	Permit Requirement		Report								
Annual Cumulative Volume Limit 03/01/14 - 02/28/15	Sample Measurement		0	Barrels/ Year					0		
	Permit Requirement		41,000								
	Sample Measurement			Barrels/ Year							
	Permit Requirement										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

No Discharge X

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From:	14	08 01	To:	14	10 31

DRILLING FLUIDS AND DRILL CUTTINGS (001)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
DRILL CUTTINGS VOLUME Well # N / A	Sample Measurement		No Discharge	Barrels/ Month							
August	Permit Requirement		Report							1/well 1/day	Estimate Grab
Well # N / A	Sample Measurement		No Discharge	Barrels/ Month							
September	Permit Requirement		Report							1/well 1/day	Estimate Grab
Well # N / A	Sample Measurement		No Discharge	Barrels/ Month							
October	Permit Requirement		Report							1/well 1/day	Estimate Grab
Annual Cumulative Volume Limit 03/01/14 - 02/28/15	Sample Measurement		0	Barrels/ Year					0		
	Permit Requirement		11,250								
DRILL FLUIDS/CUTTINGS FREE OIL	Sample Measurement				No Discharge			# Days Sheen Observed			
August	Permit Requirement				Negative Static Sheen Test/Free Oil					1/well 1/day	Visual Visual
	Sample Measurement				No Discharge			# Days Sheen Observed			
September	Permit Requirement				Negative Static Sheen Test/Free Oil					1/well 1/day	Visual Visual
	Sample Measurement				No Discharge			# Days Sheen Observed			
October	Permit Requirement				Negative Static Sheen Test/Free Oil					1/well 1/day	Visual Visual

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	(805) 934-8220	11 17 2014
TYPED OR PRINTED	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

WELL DISCHARGE MONITORING REPORT (Well DMR)

No Discharge [X]

CAG280000	001
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
	YR	MO	DAY	YR	MO	DAY
From:	14	08	01	To:	14	10	31

DRILLING FLUIDS AND DRILL CUTTINGS (001)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration		NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Maximum	Units			
DRILLING FLUIDS TOXICITY Well # N / A	Sample Measurement				N / A	% by Volume			
	Permit Requirement				LC50 > 3% SPP			(0-80%) Well Footage	Grab
DRILLING FLUIDS TOXICITY Well # N / A	Sample Measurement				N / A	% by Volume			
	Permit Requirement				LC50 > 3% SPP			(80-100%) Well Footage	Grab
BARITE MERCURY	Sample Measurement				N / A	mg / kg			
	Permit Requirement				1 mg / kg			Stock Barite	Grab
BARITE CADMIUM	Sample Measurement				N / A	mg / kg			
	Permit Requirement				3 mg / kg			Stock Barite	Grab
DRILL FLUIDS CHEMICAL INVENTORY Well # N / A					N / A				
					Report			Each Mud System	
No. DAYS DISCHARGE FOR EACH DRILLING FLUID					N / A				
					Report			# Days Each	
PROHIBITED DISCHARGE 1. Oil-based Fluids					N / A			N/A	
2. Diesel Oil 3. Non-aqueous based drilling fluids or cuttings					No Discharge			N/A	

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

N / A: No discharge of drilling fluids

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	002
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

PRODUCED WATER (002)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
PRODUCED WATER FLOW RATE	Sample Measurement	40,265		Monthly Average bbl/Day					0	1/day	Estimate
August	Permit Requirement									1/day	Estimate
	Sample Measurement	27,851		Monthly Average bbl/Day					0	1/day	Estimate
September	Permit Requirement									1/day	Estimate
	Sample Measurement	42,991		Monthly Average bbl/Day					0	1/day	Estimate
October	Permit Requirement									1/day	Estimate
QUARTERLY AVERAGE Volume		37,036		Quarterly Average bbl/Day					0	1/quarter	Estimate
08/01/14 - 10/31/14										1/quarter	Estimate
	Sample Measurement										
	Permit [1] Requirement										
ANNUAL CUMULATIVE Volume	Sample Measurement		11,158,403	Barrels/ Year					0	1/quarter	Estimate
03/01/14 - 02/28/15	Permit [1] Requirement		40,250,000								

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	002
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

PRODUCED WATER (002)
Enforceable Limits

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
PRODUCED WATER	Sample Measurement					10.5	12.0		0	1/week	Grab
OIL & GREASE$_1$	Permit Requirement					29.0	42.0	mg/L		1/week	Grab/ Composite
August											
	Sample Measurement					23.6	64.0		1*	1/week	Grab
	Permit Requirement					29.0	42.0	mg/L		1/week	Grab/ Composite
September											
	Sample Measurement					9.1	13.0		0	1/week	Grab
	Permit Requirement					29.0	42.0	mg/L		1/week	Grab/ Composite
October											

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

*Refer to cover letter.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	002
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

PRODUCED WATER (002)
Enforceable Limits

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average$_1$	Maximum$_1$	Units			
PRODUCED WATER MONTHLY [1] August	Sample Measurement					0.0040	0.0040	mg/L	0	1 / month	Grab
UNDISSOCIATED SULFIDE	Permit Requirement					0.0049	0.00577			1 / month	Grab
September	Sample Measurement					0.0033	0.0033	mg/L	0	1 / month	Grab
UNDISSOCIATED SULFIDE	Permit Requirement					0.0049	0.00577			1 / month	Grab
October	Sample Measurement					0.0045	0.0045	mg/L	0	1 / month	Grab
UNDISSOCIATED SULFIDE	Permit Requirement					0.0049	0.00577			1 / month	Grab
PRODUCED WATER CONSTITUENTS-QUARTERLY	Sample Measurement					P A SS			0	1/quarter	Composite
3-SPECIES TOXICITY	Permit Requirement					Pass / Fail				1/quarter	Composite
PRODUCED WATER CONSTITUENTS [1,2]	Sample Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
COPPER	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					0.00042	0.00042	mg/L	0	2 / year	Grab
BENZENE	Permit Requirement					N / A	N / A			1 / year	Grab
						NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
BENZO(A)ANTHRACENE						N / A	N / A			1 / year	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Results are post-dilution. N / A: There are no limits in the Permit, Appendix B.

[2] The samples were taken in September following a BSEE sampling event.
NODI(B): below MDL (laboratory's minimum detection level), the maximum value of all analytical results is less than the laboratory's MDLs.
NODI(Q): equal to or above the MDL, but less than the ML or PQL.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	002
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

PRODUCED WATER (002)
Enforceable Limits

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
PRODUCED WATER CONSTITUENTS[1,2]	Sample Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
BENZO(A)PYRENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
CHRYSENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
BENZO(B)FLUORANTHENE	Permit Requirement					N / A	N / A			1 / year	Grab
	Sample Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
BENZO(K)FLUORANTHENE	Permit Requirement					N / A	N / A			1 / year	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code / Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Results are post-dilution. N / A: There are no limits in the Permit, Appendix B.

[2] The samples were taken in September following a BSEE sampling event.

NODI(B): below MDL (laboratory's minimum detection level), if the maximum value of all analytical results is less than the laboratory's MDLs.
NODI(Q): equal to or above the MDL, but less than the ML or PQL.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge [X]

CAG280000	003
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS (003)
(Injected or commingled with produced water)
NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS FLOW [1]	Sample Measurement		No Discharge	Barrels / Job							
August	Permit Requirement		Report							1 / job	Estimate
	Sample Measurement		No Discharge	Barrels / Job							
September	Permit Requirement		Report							1 / job	Estimate
	Sample Measurement		No Discharge	Barrels / Job							
October	Permit Requirement		Report							1 / job	Estimate
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS OIL AND GREASE [1]											
						MONTHLY AVERAGE	DAILY MAXIMUM				
	Sample Measurement					No Discharge	No Discharge				
August	Permit Requirement					29.0	42.0	mg/L		1/job	Grab
	Sample Measurement					No Discharge	No Discharge				
September	Permit Requirement					29.0	42.0	mg/L		1/job	Grab
	Sample Measurement					No Discharge	No Discharge				
October	Permit Requirement					29.0	42.0	mg/L		1/job	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	(805) 934-8220	11 17 2014
TYPED OR PRINTED	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1]Well Treatment and Completion & Workover fluids are injected or commingled with produced water and are not discharged separately. Refer to produced water monitoring requirements.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge [X]

CAG280000	003
PERMIT NO.	DISCHARGE NO.

Approved Form
OMB No. 2000-0015

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS (003)
(Injected or commingled with produced water)
NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS[1] TYPE AND TOTAL NUMBER OF JOBS	Sample Measurement		0	Barrels / Job							
	Permit Requirement		Report								
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS [1], STATIC SHEEN August	Sample Measurement				No Discharge			# Times Sheen Observed			
	Permit Requirement				Negative Static Sheen Test - # Times observed-None					1/discharge	Grab
September	Sample Measurement				No Discharge			# Times Sheen Observed			
	Permit Requirement				Negative Static Sheen Test - # Times observed-None					1/discharge	Grab
October	Sample Measurement				No Discharge			# Times Sheen Observed			
	Permit Requirement				Negative Static Sheen Test - # Times observed-None					1/discharge	Grab
	Sample Measurement										
	Permit Requirement										
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS Chemical Inventory August- October	Sample Measurement				N / A						
	Permit Requirement				Report					1/job	Report
	Sample Measurement										
	Permit Requirement										

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	(805) 934-8220	11 17 2014
TYPED OR PRINTED	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1]Well Treatment and Completion & Workover fluids are injected or commingled with produced water and are not discharged separately. Refer to produced water monitoring requirements.
N / A: No WTCF this quarter.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	004
PERMIT NO.	DISCHARGE NO.

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

DECK DRAINAGE (004)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
DECK DRAINAGE VOLUME-FLOW RATE	Sample Measurement		4.7	Mo. Avg. bbl/day					0	1/month	Estimate
August	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		No Discharge	Mo. Avg. bbl/day							
September	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		No Discharge	Mo. Avg. bbl/day							
October	Permit Requirement		Report							1/month	Estimate
DECK DRAINAGE FREE OIL	Sample Measurement		0	# Days Sheen Observed	No free oil/visual sheen on the receiving water.				0	1/day	Visual - Daylight
August	Permit Requirement		0		No free oil/visual sheen on the receiving water.					1/day	Visual - Daylight
	Sample Measurement		N / A	# Days Sheen Observed	No Discharge						
September	Permit Requirement		0		No free oil/visual sheen on the receiving water.					1/day	Visual - Daylight
	Sample Measurement		N / A	# Days Sheen Observed	No Discharge						
October	Permit Requirement		0		No free oil/visual sheen on the receiving water.					1/day	Visual - Daylight

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	005
PERMIT NO.	DISCHARGE NO.

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

SANITARY & DOMESTIC WASTES (005)
(Commingled)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
SANITARY & DOMESTIC WASTES FLOW RATE (Commingled) August	Sample Measurement	37.0		Monthly Average bbl/day					0	1/day	Estimate
	Permit Requirement	Report								1/month	Estimate
September	Sample Measurement	42.0		Monthly Average bbl/day					0	1/day	Estimate
	Permit Requirement	Report								1/month	Estimate
October	Sample Measurement	38.0		Monthly Average bbl/day					0	1/day	Estimate
	Permit Requirement	Report								1/month	Estimate
SANITARY & DOMESTIC WASTES FOAM & FLOATING SOLIDS (Commingled) August	Sample Measurement		0	# days observed	No foam or floating solids in the receiving waters.				0	1/day	Visual - Daylight
	Permit Requirement		0		No foam or floating solids in the receiving waters.					1/day	Visual - Daylight
September	Sample Measurement		0	# days observed	No foam or floating solids in the receiving waters.				0	1/day	Visual - Daylight
	Permit Requirement		0		No foam or floating solids in the receiving waters.					1/day	Visual - Daylight
October	Sample Measurement		0	# days observed	No foam or floating solids in the receiving waters.				0	1/day	Visual - Daylight
	Permit Requirement		0		No foam or floating solids in the receiving waters.					1/day	Visual - Daylight

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	005
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

SANITARY & DOMESTIC WASTES (005)
(Commingled)

NOTE: Read instructions before completing this form

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
DOMESTIC WASTE, VOLUME / FOAM (commingled with Sanitary)[1]	Sample Measurement				N / A			# of Days Observed			
August	Permit Requirement				No foam or floating solids in the receiving water.					1 / day	Visual - Daylight
	Sample Measurement				N / A			# of Days Observed			
September	Permit Requirement				No foam or floating solids in the receiving water.					1 / day	Visual - Daylight
	Sample Measurement				N / A			# of Days Observed			
October	Permit Requirement				No foam or floating solids in the receiving water.					1 / day	Visual - Daylight
SANITARY / DOMESTIC WASTE RESIDUAL CHLORINE [2]	Sample Measurement				N / A	N / A	N / A	mg/l	0	Monthly	Grab
August	Permit Requirement				1 mg/l	N / A	10 mg/l			Monthly	Grab
	Sample Measurement				N / A	N / A	N / A	mg/l	0	Monthly	Grab
September	Permit Requirement				1 mg/l	N / A	10 mg/l			Monthly	Grab
	Sample Measurement				N / A	N / A	N / A	mg/l	0	Monthly	Grab
October	Permit Requirement				1 mg/l	N / A	10 mg/l			Monthly	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Reported with sanitary discharges.

[2] The sewage treatment unit is a marine sanitation device that complies with pollution control standards and regulations under Section 312 of the Clean Water Act. Thus, it is deemed to be in compliance with permit limitations for sanitary waste discharges (as per Condition II.E.1 Footnote 2 of CAG280000)

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	008
PERMIT NO.	DISCHARGE NO.

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

FIRE CONTROL WATER (008)
(deluge commingled with deck drains)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
FIRE CONTROL SYSTEM TEST WATER (008) - FOAM, FLOATING SOLIDS [1] (deluge commingled with deck drains) August	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
	Permit Requirement		0		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
September	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
	Permit Requirement		0		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
October	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
	Permit Requirement		0		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
						Monthly Average	Daily Maximum				
FIRE CONTROL SYSTEM TEST WATER (008) CHLORINE [1,2] August- October	Sample Measurement					0.0012	0.0012	mg/l	0	1/quarter	Grab
	Permit Requirement					0.00595	0.00953			1/quarter	Grab
FIRE CONTROL SYSTEM TEST WATER Chemical Inventory August- October	Sample Measurement				See Attachment #2 (Chemical Inventory)						
	Permit Requirement				Report						

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] Fire control system test water is infrequent and uses the same source water and treatment as non-contact cooling water.

[2] Chlorine values reported above are post-dilution per EPA Plumes UM. Chlorine limits are post-dilution as listed in the permit, Appendix C.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	009
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

NON-CONTACT COOLING WATER (009)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
NON-CONTACT COOLING WATER (009) - FLOW VOLUME	Sample Measurement		111,429	Barrels/ Day					0	1/month	Estimate
August	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		111,429	Barrels/ Day					0	1/month	Estimate
September	Permit Requirement		Report							1/month	Estimate
	Sample Measurement		111,429	Barrels/ Day					0	1/month	Estimate
October	Permit Requirement		Report							1/month	Estimate
NON-CONTACT COOLING WATER (009) - FOAM FLOATING SOLIDS	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
August	Permit Requirement		0		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
September	Permit Requirement		0		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
	Sample Measurement		0	# Days Observed	No floating solids in the receiving water. No foam in the receiving water.				0	1/day	Visual - Daylight
October	Permit Requirement		0		No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	(805) 934-8220	11 17 2014
TYPED OR PRINTED	Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	009
PERMIT NO.	DISCHARGE NO.

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

NON-CONTACT COOLING WATER (009)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Monthly Average	Daily Maximum	Units			
NON-CONTACT COOLING WATER (009) - CHLORINE[1]	Sample Measurement					N / A	N / A	mg/l			
	Permit Requirement					N / A[2]	N / A[2]			1/year	Grab
NON-CONTACT COOLING WATER (009) CHEMICAL INVENTORY August- October	Sample Measurement				See Attachment #2 (Chemical Inventory)				0	1/month	List
	Permit Requirement				Report					1/month	List

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	David Rose	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

[1] When applicable, chlorine values reported above are post-dilution per EPA Plumes UM. The annual chlorine residual was completed on July 24 and reported in the previous DMR.

[2] There are no limits in the Permit, Appendix C.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge [X]

Approved Form
OMB No. 2000-0015

CAG280000	019
PERMIT NO.	DISCHARGE NO.

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

EXCESS CEMENT SLURRY (019)

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
EXCESS CEMENT SLURRY (019) FLOW VOLUME	Sample Measurement		No Discharge	Monthly Average*							
August	Permit Requirement		Report	bbl/day						1/month	Estimate
	Sample Measurement		No Discharge	Monthly Average*							
September	Permit Requirement		Report	bbl/day						1/month	Estimate
	Sample Measurement		No Discharge	Monthly Average*							
October	Permit Requirement		Report	bbl/day						1/month	Estimate
ANNUAL CUMULATIVE VOLUME [1]	Sample Measurement		0	Barrels/ Year					0		
03/01/14 - 02/28/15	Permit [1] Requirement		2,000								
EXCESS CEMENT SLURRY (019) SHEEN TEST/FREE OIL FOAM, FLOATING SOLIDS	Sample Measurement		No Discharge	# Days	No Discharge						
August	Permit Requirement		None	Sheen Observed	No foam or floating solids No Oil					1/well 1/day	Visual Rec. Water
	Sample Measurement		No Discharge	# Days	No Discharge						
September	Permit Requirement		None	Sheen Observed	No foam or floating solids No Oil					1/well 1/day	Visual Rec. Water
	Sample Measurement		No Discharge	# Days	No Discharge						
October	Permit Requirement		None	Sheen Observed	No foam or floating solids No Oil					1/well 1/day	Visual Rec. Water

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	[signature]	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)
[1] Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

Approved Form
OMB No. 2000-0015

CAG280000	006,007,010,011,012,013,014
PERMIT NO.	DISCHARGE NO.

Blowout Preventer Fluids
Desalination Unit
Ballast/Storage Displacement
Bilge Water
Boiler Blowdown
Test Fluids
Diatomaceous Earth Filter Media

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
(006) Blowout Preventer Fluids FREE OIL, FOAM, FLOATING SOLIDS August- October	Sample Measurement				No Discharge						
	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(007) Desalination Unit FOAM, FLOATING SOLIDS August- October	Sample Measurement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.				0	1/month 1/discharge	Visual Rec. Water
	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(010) Ballast/Storage Displacement Water - FLOW RATE FREE OIL, FOAM, FLOATING SOLIDS August- October	Sample Measurement			Monthly Average bbl/day	No Discharge						
	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate / Visual Dayligh
(011) Bilge Water FLOW RATE August- October	Sample Measurement			Monthly Average bbl/day	No Discharge						
	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate
(012) Boiler Blowdown FOAM, FLOATING SOLIDS August- October	Sample Measurement				No Discharge						
	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(013) Test Fluids * FLOW RATE FREE OIL, FOAM, FLOATING SOLIDS August- October	Sample Measurement			Monthly Average bbl/day	No Discharge						
	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate / Visual Dayligh
(014) Diatomaceous Earth Filter Media FREE OIL, FOAM, FLOATING SOLIDS August- October	Sample Measurement				No Discharge						
	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)	Dave Rose	(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

* See Attachment 2 for Chemical Inventory, if discharged.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge ☐

CAG280000	015, 016, 017, 018, 020, 021	Bulk Water Transfer Overflow
PERMIT NO.	DISCHARGE NO.	Uncontaminated Water
		Water Flooding Discharges
		Laboratory Wastes (commingled with produced water)
		Muds, Cuttings, Cement at Sea Floor
		Hydrotest Water

Approved Form
OMB No. 2000-0015

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			(4 card only) Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units			
(015) Bulk Transfer Water Overflow FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
August- October	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(016) Uncontaminated Water FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
August- October	Permit Requirement				No floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(017) Water Flooding Discharges FREE OIL, FOAM, FLOATING SOLIDS*	Sample Measurement				No Discharge						
August- October	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(018) Laboratory Wastes FREE OIL, FOAM, FLOATING SOLIDS (commingled with produced water)	Sample Measurement				N / A (refer to produced water requirements)						
August- October	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(020) Muds, Cuttings, Cement at Sea FLOOR FREE OIL, FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
August- October	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Visual Rec. Water
(021) Hydrotest Water * FLOW RATE / FREE OIL, FOAM FLOATING SOLIDS	Sample Measurement			Monthly Average bbl/day	No Discharge						
August- October	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/month 1/discharge	Estimate / Visual Daylight
(021) Hydrotest Water CHLORINE	Sample Measurement					No Discharge	No Discharge	ug/L			
August- October	Permit Requirement					* 7.5	* 13			1/month 1/discharge	Grab

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER			TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

* See Attachment 2 for Chemical Inventory, if discharged.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

No Discharge [X]

Approved Form
OMB No. 2000-0015

CAG280000	022
PERMIT NO.	DISCHARGE NO.

MONITORING PERIOD					
YR	MO	DAY	YR	MO	DAY
From: 14	08	01	To: 14	10	31

PLATFORM HERMOSA
LOCATION: 34º 27' 15"N, 120º 38' 48"W

H2S Gas Processing Waste Water
NOTE: Read instructions before completing this form.

PARAMETER		Quantity or Loading			Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units			
(022) H2S Gas Processing Waste Water FLOW RATE	Sample Measurement	No Discharge		Monthly Average bbl/day							
August- October	Permit Requirement	Report								1/discharge	Estimate
(022) H2S Gas Processing Waste Water FREE OIL, FOAM, FLOATING SOLIDS	Sample Measurement				No Discharge						
August- October	Permit Requirement				No free oil or floating solids in the receiving water. No foam, in other than trace amounts, in the receiving water.					1/discharge	Visual - Daylight
Surfactants, Detergents, Dispersants	Sample Measurement				Minimized				0		
	Permit Requirement				Minimize						

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		TELEPHONE	DATE
David Rose Manager, Environmental, Health and Safety	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (PENALTIES UNDER THESE STATUTES MAY INCLUDE FINES UP TO $10,000 AND OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS)		(805) 934-8220	11 17 2014
TYPED OR PRINTED		Signature of PRINCIPAL EXECUTIVE OFFICER or AUTHORIZED AGENT	Area Code Number	MONTH/DAY/YEAR

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Attachment 2

Chemical Inventory

ATTACHMENT 2
PLATFORM HERMOSA
MISCELLANEOUS DISCHARGES
CHEMICAL INVENTORY
August 1, 2014 through October 31, 2014

Fluid Type	Volume (Monthly avg bbls per day)	Product Name	Estimated Chemical Quantity [2] (Monthly avg gal per day)	Average End-of-Pipe Concentration (mg/l)
009 Non-contact Cooling Water		Chlorine		
August	111,429		0.75	0.16
September	111,429		1.17	0.25
October	111,429		1.31	0.28
008 Fire Control System Water[1]		Chlorine		
August	457		0.003	0.17
September	446		0.003	0.16
October	411		0.004	0.21
013 Test Fluids	No Discharge	No Discharge	None	None
017 Water Flooding Discharges	No Discharge	No Discharge	None	None
021 Hydrotest Water	No Discharge	No Discharge	None	None

[1] Firewater volumes are estimated based on one 30 minute test approximately every 4 days (refer to cover letter).

[2] End-of-pipe concentration and chemical quantity calculated with Operations daily monitoring results using a non-EPA chlorine test method (Hach DPD Color Wheel). This method is not an official EPA test method, but using this data better represents the chemical inventory values from month to month since the official EPA test method is required only quarterly.

Attachment 3

Undissociated Sulfide Conversion Calculation Table

Platform Hermosa- Percent Undissociated sulfides (H2S) vs Total Sulfide:

DMR Quarter: August - October 2014

Standard Methods 19th Edition 1995, page 4-129

Enter Temperature as Kelvin where Temp K= Temp C+273.15 (automatic conversion at the bottom of this page).

August				Calculation As fresh water			Calculation As ocean water			Calculation as Produced water		
Ocean pH	8.1		Permit	*A*	0.501		*A*	-0.115		A	-0.138	
Produced Water pH	7		Historical									
Produced Water Temp.	352.59	k										
Ocean Water Temp	288.15	k		pfm	0.059		*B*	0.00959		B	0.00983	
Total Sulfides (Std. Mthd. 4500 S-2F)	150	mg/l	6-Aug-14	*I*	0.02		*I*	0.82		I	1.0	
Dilution *	2148		Qtr. Avg.	*St*	4.6875E-03	mole	*S*	30		S	27	Dec.04
Conductivity (produced water)	61500		Historical	***pK***	7.11		***pK'***	6.77		**pK**	6.66	
"I" (produced water)	1.0			***K'***	1.01E-07		***K'***	1.70E-07		**K**	2.18E-07	
Conductivity (ocean water)	51300		6-Aug-14	**[H]**	2.04E-07		**[H]**	1.03E-08		**[H]**	1.26E-07	
"I" (ocean water)	0.82			**[H2S]**	3.13E-03	mole	**[H2S]**	2.68E-04	mole	**[H2S]**	1.72E-03	
				H2S as S	100.16	mg/L	**H2S as S**	8.58	mg/L	**H2S as S**	54.99	**mg/L**
							pfm	0.115		**pfm**	0.102	
% H2S:								5.72%			36.66%	
Conc. as H2S (undissociated)								8.58	mg/l		54.99	mg/l
H2S Post Dilution:								0.0040	mg/l		0.0256	mg/l
H2S Post Dilution (ug/l):								3.997	ug/l		25.601	ug/l

Conditions:

* Dilution calculated from quarterly average flow rate and the outfall configuation for this reporting quarter.

Ocean water pH:8.1, salinity 30 g/kg as listed in the General NPDES permit. Produced water Temperature, pH and conductivity based on averages.

I = 1.6x10-5 Conductivity (Stand.Methods 19th Edition, page 2-31).

Ocean water conditions for pH, Temp, Salinity, and conductivity will dominate over those for produced water at the edge of the 100m mixing zone.

pK' (under ocean water) uses pK (7.11 as freshwater) in the PK' calculation which also includes standard ocean conditions (for pH, Salinity, Temp).

Temperature conversion:			
C = 5/9 (F-32)	Temp F	Temp	Temp. K
Produced Water:	175	79.44	352.59
Ocean Water:	59	15.00	288.15

Platform Hermosa- Percent Undissociated sulfides (H_2S) vs Total Sulfide:

DMR Quarter: August - October 2014

Standard Methods 19th Edition 1995, page 4-129

Enter Temperature as Kelvin where Temp K= Temp C+273.15 (automatic conversion at the bottom of this page).

September			Calculation As fresh water			Calculation As ocean water			Calculation as Produced water		
Ocean pH	8.1	Permit	*A*	0.501		*A*	-0.115		A	-0.138	
Produced Water pH	7	Historical									
Produced Water Temp.	352.59 k										
Ocean Water Temp	288.15 k		pfm	0.059		*B*	0.00959		B	0.00983	
Total Sulfides (Std. Mthd. 4500 S-2F)	125 mg/l	8-Sep-14	*I*	0.02		*I*	0.83		I	1.0	
Dilution *	2148	Qtr. Avg.	*St*	3.9063E-03	mole	*S*	30		S	27	Dec.04
Conductivity (produced water)	61500	Historical	***pK***	7.11		***pK'***	6.77		**pK**	6.66	
"I" (produced water)	1.0		***K'***	1.01E-07		***K'***	1.70E-07		**K**	2.18E-07	
Conductivity (ocean water)	51600	8-Sep-14	**[H]**	2.04E-07		**[H]**	1.03E-08		**[H]**	1.26E-07	
"I" (ocean water)	0.83		**[H2S]**	2.61E-03	mole	**[H2S]**	2.23E-04	mole	**[H2S]**	1.43E-03	
			H2S as S	83.47	mg/L	**H2S as S**	7.15	mg/L	**H2S as S**	45.83	**mg/L**
						pfm	0.114		**pfm**	0.102	
% H2S:							5.72%			36.66%	
Conc. as H2S (undissociated)							7.15	mg/l		45.83	mg/l
H2S Post Dilution:							0.0033	mg/l		0.0213	mg/l
H2S Post Dilution (ug/l):							3.328	ug/l		21.334	ug/l

Conditions:

* Dilution calculated from quarterly average flow rate and the outfall configuation for this reporting quarter.

Ocean water pH:8.1, salinity 30 g/kg as listed in the General NPDES permit. Produced water Temperature, pH and conductivity based on averages.

I = 1.6x10-5 Conductivity (Stand.Methods 19th Edition, page 2-31).

Ocean water conditions for pH, Temp, Salinity, and conductivity will dominate over those for produced water at the edge of the 100m mixing zone.

pK' (under ocean water) uses pK (7.11 as freshwater) in the PK' calculation which also includes standard ocean conditions (for pH, Salinity, Temp).

Temperature conversion:			
C = 5/9 (F-32)	Temp F	Temp	Temp. K
Produced Water:	175	79.44	352.59
Ocean Water:	59	15.00	288.15

Platform Hermosa- Percent Undissociated sulfides (H_2S) vs Total Sulfide:

DMR Quarter: August - October 2014

Standard Methods 19th Edition 1995, page 4-129

Enter Temperature as Kelvin where Temp K= Temp C+273.15 (automatic conversion at the bottom of this page).

October			Calculation As fresh water			Calculation As ocean water			Calculation as Produced water		
Ocean pH	8.1	Permit	*A*	0.501		*A*	-0.115		A	-0.138	
Produced Water pH	7	Historical									
Produced Water Temp.	352.59 k										
Ocean Water Temp	288.15 k		pfm	0.059		*B*	0.00959		B	0.00983	
Total Sulfides (Std. Mthd. 4500 S-2F)	170 mg/l	9-Oct-14	*I*	0.02		*I*	0.82		I	1.0	
Dilution *	2148	Qtr. Avg.	*St*	5.3125E-03	mole	*S*	30		S	27	Dec.04
Conductivity (produced water)	61500	Historical	***pK***	7.11		***pK'***	6.77		pK	6.66	
"I" (produced water)	1.0		***K'***	1.01E-07		***K'***	1.70E-07		K	2.18E-07	
Conductivity (ocean water)	51400	9-Oct-14	**[H]**	2.04E-07		**[H]**	1.03E-08		**[H]**	1.26E-07	
"I" (ocean water)	0.82		**[H2S]**	3.55E-03	mole	**[H2S]**	3.04E-04	mole	**[H2S]**	1.95E-03	
			H2S as S	113.52	mg/L	**H2S as S**	9.73	mg/L	**H2S as S**	62.32	**mg/L**
						pfm	0.115		**pfm**	0.102	
% H2S:							5.72%			36.66%	
Conc. as H2S (undissociated)							9.73	mg/l		62.32	mg/l
H2S Post Dilution:							0.0045	mg/l		0.0290	mg/l
H2S Post Dilution (ug/l):							4.528	ug/l		29.015	ug/l

Conditions:

* Dilution calculated from quarterly average flow rate and the outfall configuation for this reporting quarter.

Ocean water pH:8.1, salinity 30 g/kg as listed in the General NPDES permit. Produced water Temperature, pH and conductivity based on averages.

I = 1.6x10-5 Conductivity (Stand.Methods 19th Edition, page 2-31).

Ocean water conditions for pH, Temp, Salinity, and conductivity will dominate over those for produced water at the edge of the 100m mixing zone.

pK' (under ocean water) uses pK (7.11 as freshwater) in the PK' calculation which also includes standard ocean conditions (for pH, Salinity, Temp).

Temperature conversion: C = 5/9 (F-32)	Temp F	Temp	Temp. K
Produced Water:	175	79.44	352.59
Ocean Water:	59	15.00	288.15

Attachment 4

Fire Water
Chlorine Residual Results

ATTACHMENT 4
PLATFORM HERMOSA
FIRE WATER CHLORINE RESULTS
August 1, 2014 through October 31, 2014

Discharge	Measurement Frequency	Average Monthly Limit* Post Dilution (mg/l)	Maximum Daily Limit* Post Dilution (mg/l)	Result Post Dilution (mg/l)	End-of-Pipe Concentration (mg/l)	EPA Plumes Dilution
008 Fire Control System Water Sampled 08/06/14	Once/Quarter	0.00595	0.00953	0.0012	EP A Method 330.5 0.2	161:1

* Post-dilution limits are listed in the permit, Appendix C.

N / A: There are no limits in the permit.

Attachment 5

Miscellaneous NPDES Monitoring

ATTACHMENT 5
PLATFORM HERMOSA
MISCELLANEOUS MONITORING
May 1, 2014 through July 31, 2014

Sample Location	Sample Date	Constituents	EPA Method	Lab Value	Units
Ocean Water at Fire Water Pumps	8/6/2014	Specific Conductivity	120.1	51,300	unhos/cm
	9/8/2014	Specific Conductivity	120.1	51,600	unhos/cm
Produced Water	9/18/2014	Benzene	602	0.9	mg/L
	9/18/2014	Copper	200.7	< 0.004	mg/L
	9/18/2014	Oil and Grease	1664	64.0	mg/L
	9/18/2014	Total Sulfide	$4500S^{-2}F$	160	mg/l
	9/18/2014	Benzo (a) anthracene	625	< 0.0038	mg/L
	9/18/2014	Benzo (a) pyrene	625	< 0.0026	mg/L
	9/18/2014	Benzo (b) fluoranthene	625	< 0.0028	mg/L
	9/18/2014	Benzo (k) fluoranthene	625	< 0.0044	mg/L
	9/18/2014	Chrysene	625	< 0.0038	mg/L
	9/18/2014	Dibenzo (a,h) anthracene	625	< 0.0016	mg/L

Specific Conductivity results were used in sulfide conversion calculations.

[2] The produced water samples on September 18 were taken following a BSEE sampling event and the results are included in the DMR.

Attachment 6

Laboratory reports for Oil and Grease and additional NPDES monitoring

Laboratory Quality Control Reports

LTS ENVIRONMENTAL, INC.

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, Ca 93455

September 2, 2014

Attn: Ruth Juris

Quarterly NPDES chlorine residual on the fire water outlet is as follows:

Sample Date / Time	**Location**	**Total Chlorine Residual** *(EPA Method 330.5)*
	Platform Hermosa	End of Pipe
August 6, 2014 @ 1700 hrs	Firewater Outlet	0.2 mg/l
LTS Meter S/N: 12040E195572 Technician: Mike Apple		Method Blank < 0.05 mg/l (MDL)

S.G. Lawry
Environmental Specialist / LTS

704 Adirondack Ave. • Ventura, Ca 93003 • (805) 644-4560 • Fax (805) 644-4560

LTS ENVIRONMENTAL, INC.

September 8, 2014

Quality Control

As part of the annual in-house quality control chlorine meter check and to ensure proper operation of the meters, LTS Environmental performed a total residual chlorine test with a known value obtained from RT Corporation. Results of this test are as follows:

Test Date	**Total Residual Chlorine**
September 5, 2014	*(EPA Method 330.5)*
LTS meter (SN 041200088375)	**0.57 mg/l**
LTS meter (SN 12040E195572)	**0.52 mg/l**
RT Corporation test sample: (Lot #QC1065-021081)	
Acceptance Limits	**0.481 – 0.835 mg/l**
Certified Value	0.658 mg/l ± 0.0110
	Method Blank < 0.05 mg/l
LTS Lead Technician: Mike Apple	

S.G. Lawry
Environmental Specialist
President, LTS

704 Adirondack Ave. • Ventura, Ca 93003 • (805) 644-4560 • Fax (805) 644-4560

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: August 13, 2014
Laboratory Number: 142040
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On August 7, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142040-01
UNICEL OUT	142040-02*
UNICEL OUT	142040-03*
UNICEL OUT	142040-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142040
Analyst: GM

Date Sampled: 08/06/14
Date Received: 08/07/14
Date Analyzed: 08/11/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142040-01	Unicel Out	12	1	1	5

QUALITY CONTROL DATA

142040-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142040

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report t** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

8/14

8/15

FACILITY: *Hermosa*
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*Unicel out*	*grab*	*1*	Date: 8/6/14 Time: 1600	*HCl*	*EPA 1664 Abs (12) IR (14)*
2		*grab*	*1*	*1615*		
3		*grab*	*1*	*1630*		
4		*grab*	*1*	*1645*		
						Field notes
						178 F. 130 ppm Sulfides field test
						19K H2S.

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 8-7-14
Received by:	Time: 1320

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: August 20, 2014
Laboratory Number: 142082
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On August 13, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142082-01
UNICEL OUT	142082-02*
UNICEL OUT	142082-03*
UNICEL OUT	142082-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142082
Analyst: GM

Date Sampled: 08/11/14
Date Received: 08/13/14
Date Analyzed: 08/14/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142082-01	Unicel Out	9.0	1	1	5

QUALITY CONTROL DATA

142082-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142082

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services 8/20
REPORT TO: _____ PHONE: _____ 8/21
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 8/11/14 Time: 1200	HCl	EPA 1664 Abs (9) IR (10)
2		grab	1	1230	"	Abs (12) IR (14)
3		grab	1	1300		
4		grab	1	1330		
						Field notes
						130ppm field test. (sulfides)

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 8.13.14
Received by:	Time: 945

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: August 27, 2014
Laboratory Number: 142166
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On August 22, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142166-01
UNICEL OUT	142166-02*
UNICEL OUT	142166-03*
UNICEL OUT	142166-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142166
Analyst: GM

Date Sampled: 08/21/14
Date Received: 08/22/14
Date Analyzed: 08/25/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142166-01	Unicel Out	10	1	1	5

QUALITY CONTROL DATA

142166-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142166

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report t** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

8/29

FACILITY: *Hermosa*
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*Unicel out*	*grab*	*1*	Date: 8/21/14 Time: 815	*HCl*	*EPA 1664 Abs (10) IR (12)*
2		*grab*	*1*	*845*		
3		*grab*	*1*	*915*		
4		*grab*	*1*	*945*		
						Field notes
						22K H2S. 130 ppm field sulfides test
						1400 IR (11).

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 8-22-14
Received by:	Time: 1505

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 3, 2014
Laboratory Number: 142204
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On August 28, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
U. OUT	142204-01
U. OUT	142204-02*
U. OUT	142204-03*
U. OUT	142204-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142204
Analyst: GM

Date Sampled: 08/26/14
Date Received: 08/28/14
Date Analyzed: 09/02/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142204-01	U. Out	11	1	1	5

QUALITY CONTROL DATA

142204-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142204

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

9/4 9/5

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	U. out	grab	1	Date: 8.26.14 Time: 1900	HCl	EPA 1664 Abs (4) IR (9) ~
2	↓	grab	1	1930	↓	
3		grab	1	2000		
4		grab	1	2030		
						Field notes
						online: 2.0.
						B-9 005, down to 0) ESP.
						Sample point flow took up to
						5 minutes per sample to fill.

Comments: **Run #1. Hold rest.**

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date: 8/28/14
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 11, 2014
Laboratory Number: 142282
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On September 5, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142282-01
UNICEL OUT	142282-02*
UNICEL OUT	142282-03*
UNICEL OUT	142282-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

/Keith Chang

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142282
Analyst: GM

Date Sampled: 09/02/14
Date Received: 09/05/14
Date Analyzed: 09/09/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142282-01	Unicel Out	13	1	1	5

QUALITY CONTROL DATA

142282-MB	Method Blank	ND	1	1	5

142282

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report t** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

9/12
9/15

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 9.2.14 Time: 1900	HCl	EPA 1664 ABS (10) IR (12)
2		grab	1	1930		
3		grab	1	2000		
4		grab	1	2030		
						Field notes
						27K (H2S)

Comments: **Run #1. Hold rest.**

Relinquished by: _____ Date: 9.5.14
Received by: _____ Time: 1005

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 16, 2014
Laboratory Number: 142330
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On September 11, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142330-01
UNICEL OUT	142330-02*
UNICEL OUT	142330-03*
UNICEL OUT	142330-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 09/08/14
CAS LAB NO: 142330 Date Received: 09/11/14
Analyst: GM Date Analyzed: 09/15/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142330-01	Unicel Out	8.7	1	1	5

QUALITY CONTROL DATA

142330-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142330

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

9/18 9/19

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 9.8.14 Time: 2000	HCl	EPA 1664 ABS (12) IR(14)
2		grab	1	2015		
3		grab	1	2030		
4		grab	1	2045		
						Field notes

Comments: **Run #1. Hold rest.**

Relinquished by:		Date: 9.11.14	
Received by:		Time: 845	
Relinquished by:		Date: 09/11/14	
Received by:		Time: 8:50	
Relinquished by:		Date:	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 24, 2014
Laboratory Number: 142387
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On September 18, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142387-01
UNICEL OUT	142387-02*
UNICEL OUT	142387-03*
UNICEL OUT	142387-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

142387

Chain of Custody

LTS Environmental, Inc. **704 Adirondack Avenue** **Ventura, CA 93003** **805-644-4560**	**Report t** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: *Hermosa*
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

9/25 9/26

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*Unicel out*	*grab*	*1*	Date: 9/17/14 Time: 1200	*HCl*	*EPA 1664 Abs (13) IR (15)*
2		*grab*	*1*	*1215*		
3		*grab*	*1*	*1230*		
4		*grab*	*1*	*1245*		
						Field notes
						V-97 IR (26). See other chain. *20 k H2S*

Comments: **Run #1. Hold rest.**

Relinquished by:		Date: 9-18-14	
Received by:		Time: 1405	
Relinquished by:		Date: 09/18/14	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS Environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 24, 2014
Laboratory Number: 142406
Project Name: Platform Hermosa Produced Water Well Sampling
Sampled By: Client

9/18 BSEE Duplicates

On September 19, 2014, Capco Analytical Services, Inc.(CAS), received five(5) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
NPDES DIFFUSER	142406-01
NPDES DIFFUSER	142406-02
NPDES DIFFUSER	142406-03
NPDES DIFFUSER	142406-04
NPDES DISSUSER	142406-05

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chang

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa Supervisor @-Orcutt
Ruth Juris-EDT
Mike Apple-EDT

Note: S-VOC's analysis results will be available 9/26/14.

If you have any further questions or concerns, please contact me at your convenience. This report consists of 5 pages excluding the cover letter and the Chain of Custody.

Client:	Freeport-McMoran O&G (Hermosa)	Date Sampled:	09/18/14
Matrix:	WATER	Date Received:	09/19/14
Analyst:	GP	Date Analyzed:	09/23/14

BENZENE
EPA METHOD 602

Compound	Results ug/L	Dilution Factor	MDL ug/L	PQL ug/L	Surrogate %Recovery
CAS Lab # :	MB-092214				
Client ID :	METHOD BLANK	09/22/14			
	BQL	1	0.2	1.0	92%
CAS Lab # :	142406 -01				
Client ID :	NPDES PROD. WATER	09/23/14			
	900	50	10	100	88%

CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)
CAS LAB NO: 142406
Analyst: ABE

Date Sampled: 09/18/14
Date Received: 09/19/14
Date Analyzed: 09/22/14
Sample Matrix: Water

TOTAL COPPER
EPA Method 200.7

CAS Lab #	Sample ID	RESULTS (µg/L)	Dilution Factor	PQL (µg/L)	MDL (µg/L)
142406-05	NPDES Diffuser	ND	1	20	4

QUALITY CONTROL SECTION

142406-MB	Method Blank	ND	1	20	4

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)
CAS LAB NO: 142405
Analyst: AN/GM

Date Sampled: 09/18/14
Date Received: 09/19/14
Sample Matrix: Water

WET CHEMISTRY SUMMARY

COMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
CAS Lab#: 142406-01							
Sample ID: NPDES Diffuser							
Oil & Grease	64	mg/L	1	5.0	1.0	1664	09/22/14
CAS Lab#: 142406-04							
Sample ID: NPDES Diffuser							
Total Sulfide	160	mg/L	1	0.2	0.04	4500S^{-2}F	09/22/14

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

CERTIFICATE OF ANALYSIS

Client:	Capco Analytical Services 1536 Eastman Avenue Ventura CA, 93003	**Report Date:**	09/30/14 14:45
		Received Date:	09/23/14 09:50
		Turn Around:	3 workdays
Attention:	Dr. Keith Chang	**Client Project:**	Weck Lab 142406
Phone:	(805) 644-1095		
Fax:	(805) 644-9947	**PO Number:**	715381
Work Order(s):	4I23002		

NELAP #04229CA ELAP#1132 NEVADA #CA211 HAWAII LACSD #10143

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. Weck Laboratories, Inc. certifies that the test results meet all NELAC requirements unless noted in the case narrative. This analytical report is confidential and is only intended for the use of Weck Laboratories, Inc. and its client. This report contains the Chain of Custody document, which is an integral part of it, and can only be reproduced in full with the authorization of Weck Laboratories, Inc.

Dear Dr. Keith Chang :

Enclosed are the results of analyses for samples received 09/23/14 09:50 with the Chain of Custody document. The samples were received in good condition, at 7.8 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Case Narrative:

Reviewed by:

Kim G Tu
Project Manager

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sampled by:	Sample Comments	Lab ID	Matrix	Date Sampled
142406-02	Client		4I23002-01	Water	09/18/14 14:39

ANALYSES

Acid and Base/Neutral Extractables by EPA Method 625

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

4I23002-01 **142406-02**

Sampled: 09/18/14 14:39 **Sampled By:** Client **Matrix:** Water

Acid and Base/Neutral Extractables by EPA Method 625

Method: EPA 625 Batch: W4I1158 Prepared: 09/23/14 09:09 Analyst: Armando Bielma

Analyte	Result	MDL	MRL	Units	Dil	Analyzed	Qualifier
Benzo (a) anthracene	ND	3.8	20	ug/l	20	09/24/14 17:35	M-04
Benzo (a) pyrene	ND	2.6	20	ug/l	20	09/24/14 17:35	M-04
Benzo (b) fluoranthene	ND	2.8	20	ug/l	20	09/24/14 17:35	M-04
Benzo (k) fluoranthene	ND	4.4	20	ug/l	20	09/24/14 17:35	M-04
Chrysene	ND	3.8	20	ug/l	20	09/24/14 17:35	M-04
Dibenzo (a,h) anthracene	ND	1.6	40	ug/l	20	09/24/14 17:35	M-04
Surr: 2,4,6-Tribromophenol	*19 %*	Conc:*9.40*	*25-102*	%			*M-04, S-GC*
Surr: 2-Fluorobiphenyl	*62 %*	Conc:*15.4*	*22-107*	%			*M-04*
Surr: 2-Fluorophenol	*46 %*	Conc:*22.8*	*3-74*	%			*M-04*
Surr: Nitrobenzene-d5	*74 %*	Conc:*18.6*	*27-111*	%			*M-04*
Surr: Phenol-d5	*45 %*	Conc:*22.6*	*0.1-53*	%			*M-04*
Surr: Terphenyl-d14	*53 %*	Conc:*13.2*	*28-113*	%			*M-04*

QUALITY CONTROL SECTION

QUALITY CONTROL SECTION

Sample ID: Method Blank
CAS LAB NO: 142406-MB

Analyst: AN/GM

WET CHEMISTRY SUMMARY

CPMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
Oil & Grease	ND	mg/L	1	5.0	1.0	1664	09/22/14
Total Sulfide	ND	mg/L	1	0.2	0.04	4500S^{-2}F	09/22/14

DF: Dilution Factor
mg/L: Milligrams/Liter(ppm)
ND: Not Detected or <MDL

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

QUALITY CONTROL SECTION

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W4I1158-BLK1)					Analyzed: 09/24/14 15:09						
1,2,4-Trichlorobenzene	ND	0.55	1.0	ug/l							
1,2-Dichlorobenzene	ND	0.57	1.0	ug/l							
1,2-Diphenylhydrazine/Azobenzene	ND	0.25	1.0	ug/l							
1,3-Dichlorobenzene	ND	0.53	1.0	ug/l							
1,4-Dichlorobenzene	ND	0.55	1.0	ug/l							
2,4,6-Trichlorophenol	ND	0.22	1.0	ug/l							
2,4-Dichlorophenol	ND	0.26	1.0	ug/l							
2,4-Dimethylphenol	ND	0.30	1.0	ug/l							
2,4-Dinitrophenol	ND	1.6	10	ug/l							
2,4-Dinitrotoluene	ND	0.18	1.0	ug/l							
2,6-Dinitrotoluene	ND	0.27	1.0	ug/l							
2-Chloronaphthalene	ND	0.45	1.0	ug/l							
2-Chlorophenol	ND	0.28	1.0	ug/l							
2-Methyl-4,6-dinitrophenol	ND	1.7	5.0	ug/l							
2-Nitrophenol	ND	0.26	1.0	ug/l							
3,3'-Dichlorobenzidine	ND	1.2	5.0	ug/l							
4,6-Dinitro-2-methylphenol	ND	1.7	5.0	ug/l							
4-Bromophenyl phenyl ether	ND	0.36	1.0	ug/l							
4-Chloro-3-methylphenol	ND	0.23	1.0	ug/l							
4-Chlorophenyl phenyl ether	ND	0.41	1.0	ug/l							
4-Nitrophenol	ND	0.45	5.0	ug/l							
Acenaphthene	ND	0.38	1.0	ug/l							
Acenaphthylene	ND	0.40	1.0	ug/l							
Anthracene	ND	0.34	1.0	ug/l							
Benzidine	ND	3.7	10	ug/l							
Benzo (a) anthracene	ND	0.19	1.0	ug/l							
Benzo (a) pyrene	ND	0.13	1.0	ug/l							
Benzo (b) fluoranthene	ND	0.14	1.0	ug/l							
Benzo (g,h,i) perylene	ND	0.10	2.0	ug/l							
Benzo (k) fluoranthene	ND	0.22	1.0	ug/l							
Benzyl butyl phthalate	ND	0.18	1.0	ug/l							
Bis(2-chloroethoxy)methane	ND	0.25	1.0	ug/l							
Bis(2-chloroethyl)ether	ND	0.27	1.0	ug/l							
Bis(2-chloroisopropyl)ether	ND	0.38	1.0	ug/l							
Bis(2-ethylhexyl)phthalate	ND	2.3	5.0	ug/l							
Butyl benzyl phthalate	ND	0.18	1.0	ug/l							
Chrysene	ND	0.19	1.0	ug/l							
Dibenzo (a,h) anthracene	ND	0.080	2.0	ug/l							
Diethyl phthalate	ND	0.15	1.0	ug/l							

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W4I1158-BLK1)					Analyzed: 09/24/14 15:09						
Dimethyl phthalate	ND	0.18	1.0	ug/l							
Di-n-butyl phthalate	ND	0.24	1.0	ug/l							
Di-n-octyl phthalate	ND	0.19	1.0	ug/l							
Fluoranthene	ND	0.22	1.0	ug/l							
Fluorene	ND	0.35	1.0	ug/l							
Hexachlorobenzene	ND	0.49	1.0	ug/l							
Hexachlorobutadiene	ND	0.47	1.0	ug/l							
Hexachlorocyclopentadiene	ND	1.5	5.0	ug/l							
Hexachloroethane	ND	0.52	1.0	ug/l							
Indeno (1,2,3-cd) pyrene	ND	0.12	2.0	ug/l							
Isophorone	ND	0.21	1.0	ug/l							
Naphthalene	ND	0.49	1.0	ug/l							
Nitrobenzene	ND	0.36	1.0	ug/l							
N-Nitrosodimethylamine	ND	0.14	1.0	ug/l							
N-Nitrosodi-n-propylamine	ND	0.26	1.0	ug/l							
N-Nitrosodiphenylamine	ND	0.19	1.0	ug/l							
Pentachlorophenol	ND	0.19	1.0	ug/l							
Phenanthrene	ND	0.32	1.0	ug/l							
Phenol	ND	0.16	1.0	ug/l							
Pyrene	ND	0.25	1.0	ug/l							
Surr: 2,4,6-Tribromophenol	*42.5*			*ug/l*	*50.0*		*85*	*25-102*			
Surr: 2-Fluorobiphenyl	*20.7*			*ug/l*	*25.0*		*83*	*22-107*			
Surr: 2-Fluorophenol	*26.1*			*ug/l*	*50.0*		*52*	*3-74*			
Surr: Nitrobenzene-d5	*18.7*			*ug/l*	*25.0*		*75*	*27-111*			
Surr: Phenol-d5	*16.5*			*ug/l*	*50.0*		*33*	*0.1-53*			
Surr: Terphenyl-d14	*21.5*			*ug/l*	*25.0*		*86*	*28-113*			
LCS (W4I1158-BS1)					Analyzed: 09/24/14 15:39						
1,2,4-Trichlorobenzene	15.6	0.55	1.0	ug/l	25.0		62	44-142			
1,2-Dichlorobenzene	15.4	0.57	1.0	ug/l	25.0		62	32-129			
1,3-Dichlorobenzene	14.4	0.53	1.0	ug/l	25.0		58	0.1-172			
1,4-Dichlorobenzene	16.5	0.55	1.0	ug/l	25.0		66	20-124			
2,4,6-Trichlorophenol	18.9	0.22	1.0	ug/l	25.0		75	37-144			
2,4-Dichlorophenol	18.3	0.26	1.0	ug/l	25.0		73	39-135			
2,4-Dimethylphenol	14.8	0.30	1.0	ug/l	25.0		59	32-119			
2,4-Dinitrophenol	18.3	1.6	10	ug/l	25.0		73	0.1-191			
2,4-Dinitrotoluene	20.8	0.18	1.0	ug/l	25.0		83	39-139			
2,6-Dinitrotoluene	18.4	0.27	1.0	ug/l	25.0		73	50-158			
2-Chloronaphthalene	19.7	0.45	1.0	ug/l	25.0		79	60-118			
2-Chlorophenol	14.2	0.28	1.0	ug/l	25.0		57	23-134			
2-Methyl-4,6-dinitrophenol	20.1	1.7	5.0	ug/l	25.0		80	0.1-181			

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W4I1158-BS1)					Analyzed: 09/24/14 15:39						
2-Nitrophenol	16.3	0.26	1.0	ug/l	25.0		65	29-182			
3,3'-Dichlorobenzidine	20.5	1.2	5.0	ug/l	25.0		82	0.1-262			
4,6-Dinitro-2-methylphenol	20.1	1.7	5.0	ug/l	25.0		80	0.1-181			
4-Bromophenyl phenyl ether	16.6	0.36	1.0	ug/l	25.0		66	53-127			
4-Chloro-3-methylphenol	14.5	0.23	1.0	ug/l	25.0		58	22-147			
4-Chlorophenyl phenyl ether	20.3	0.41	1.0	ug/l	25.0		81	25-158			
4-Nitrophenol	8.66	0.45	5.0	ug/l	25.0		35	0.1-132			
Acenaphthene	22.0	0.38	1.0	ug/l	25.0		88	47-145			
Acenaphthylene	22.3	0.40	1.0	ug/l	25.0		89	33-145			
Anthracene	21.6	0.34	1.0	ug/l	25.0		86	27-133			
Benzo (a) anthracene	21.9	0.19	1.0	ug/l	25.0		88	33-143			
Benzo (a) pyrene	24.4	0.13	1.0	ug/l	25.0		98	17-163			
Benzo (b) fluoranthene	24.0	0.14	1.0	ug/l	25.0		96	24-159			
Benzo (g,h,i) perylene	29.8	0.10	2.0	ug/l	25.0		119	0.1-219			
Benzo (k) fluoranthene	25.1	0.22	1.0	ug/l	25.0		100	11-162			
Benzyl butyl phthalate	24.3	0.18	1.0	ug/l	25.0		97	0.1-152			
Bis(2-chloroethoxy)methane	18.6	0.25	1.0	ug/l	25.0		74	33-184			
Bis(2-chloroethyl)ether	17.4	0.27	1.0	ug/l	25.0		70	12-158			
Bis(2-chloroisopropyl)ether	17.8	0.38	1.0	ug/l	25.0		71	36-166			
Bis(2-ethylhexyl)phthalate	18.9	2.3	5.0	ug/l	25.0		76	8-158			
Butyl benzyl phthalate	24.3	0.18	1.0	ug/l	25.0		97	0.1-152			
Chrysene	21.8	0.19	1.0	ug/l	25.0		87	17-168			
Dibenzo (a,h) anthracene	26.5	0.080	2.0	ug/l	25.0		106	0.1-227			
Diethyl phthalate	21.2	0.15	1.0	ug/l	25.0		85	0.1-114			
Dimethyl phthalate	22.1	0.18	1.0	ug/l	25.0		88	0.1-112			
Di-n-butyl phthalate	26.6	0.24	1.0	ug/l	25.0		106	1-118			
Di-n-octyl phthalate	27.4	0.19	1.0	ug/l	25.0		110	4-146			
Fluoranthene	22.4	0.22	1.0	ug/l	25.0		90	26-137			
Fluorene	22.5	0.35	1.0	ug/l	25.0		90	59-121			
Hexachlorobenzene	19.2	0.49	1.0	ug/l	25.0		77	0.1-152			
Hexachlorobutadiene	17.2	0.47	1.0	ug/l	25.0		69	24-116			
Hexachlorocyclopentadiene	11.9	1.5	5.0	ug/l	25.0		48	0.1-81			
Hexachloroethane	14.2	0.52	1.0	ug/l	25.0		57	40-113			
Indeno (1,2,3-cd) pyrene	25.2	0.12	2.0	ug/l	25.0		101	0.1-171			
Isophorone	17.5	0.21	1.0	ug/l	25.0		70	21-196			
Naphthalene	19.6	0.49	1.0	ug/l	25.0		78	21-133			
Nitrobenzene	16.8	0.36	1.0	ug/l	25.0		67	35-180			
N-Nitrosodimethylamine	11.0	0.14	1.0	ug/l	25.0		44	15-59			
N-Nitrosodi-n-propylamine	18.0	0.26	1.0	ug/l	25.0		72	0.1-230			

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W4I1158-BS1)					Analyzed: 09/24/14 15:39						
N-Nitrosodiphenylamine	16.6	0.19	1.0	ug/l	25.0		67	42-90			
Pentachlorophenol	21.7	0.19	1.0	ug/l	25.0		87	14-176			
Phenanthrene	22.7	0.32	1.0	ug/l	25.0		91	54-120			
Phenol	7.05	0.16	1.0	ug/l	25.0		28	5-112			
Pyrene	23.0	0.25	1.0	ug/l	25.0		92	52-115			
Surr: 2,4,6-Tribromophenol	*37.0*			*ug/l*	*50.0*		*74*	*25-102*			
Surr: 2-Fluorobiphenyl	*20.5*			*ug/l*	*25.0*		*82*	*22-107*			
Surr: 2-Fluorophenol	*21.8*			*ug/l*	*50.0*		*44*	*3-74*			
Surr: Nitrobenzene-d5	*16.4*			*ug/l*	*25.0*		*66*	*27-111*			
Surr: Phenol-d5	*14.6*			*ug/l*	*50.0*		*29*	*0.1-53*			
Surr: Terphenyl-d14	*19.8*			*ug/l*	*25.0*		*79*	*28-113*			
LCS Dup (W4I1158-BSD1)					Analyzed: 09/24/14 16:08						
1,2,4-Trichlorobenzene	16.2	0.55	1.0	ug/l	25.0		65	44-142	4	30	
1,2-Dichlorobenzene	16.5	0.57	1.0	ug/l	25.0		66	32-129	6	30	
1,3-Dichlorobenzene	15.4	0.53	1.0	ug/l	25.0		62	0.1-172	7	30	
1,4-Dichlorobenzene	17.3	0.55	1.0	ug/l	25.0		69	20-124	5	30	
2,4,6-Trichlorophenol	18.6	0.22	1.0	ug/l	25.0		74	37-144	1	30	
2,4-Dichlorophenol	18.3	0.26	1.0	ug/l	25.0		73	39-135	0.05	30	
2,4-Dimethylphenol	15.9	0.30	1.0	ug/l	25.0		63	32-119	7	30	
2,4-Dinitrophenol	19.8	1.6	10	ug/l	25.0		79	0.1-191	8	30	
2,4-Dinitrotoluene	22.8	0.18	1.0	ug/l	25.0		91	39-139	9	30	
2,6-Dinitrotoluene	19.9	0.27	1.0	ug/l	25.0		80	50-158	8	30	
2-Chloronaphthalene	20.2	0.45	1.0	ug/l	25.0		81	60-118	3	30	
2-Chlorophenol	15.2	0.28	1.0	ug/l	25.0		61	23-134	7	30	
2-Methyl-4,6-dinitrophenol	21.9	1.7	5.0	ug/l	25.0		88	0.1-181	9	30	
2-Nitrophenol	17.4	0.26	1.0	ug/l	25.0		70	29-182	6	30	
3,3'-Dichlorobenzidine	23.1	1.2	5.0	ug/l	25.0		92	0.1-262	12	30	
4,6-Dinitro-2-methylphenol	21.9	1.7	5.0	ug/l	25.0		88	0.1-181	9	30	
4-Bromophenyl phenyl ether	17.1	0.36	1.0	ug/l	25.0		68	53-127	3	30	
4-Chloro-3-methylphenol	14.8	0.23	1.0	ug/l	25.0		59	22-147	2	30	
4-Chlorophenyl phenyl ether	20.6	0.41	1.0	ug/l	25.0		82	25-158	1	30	
4-Nitrophenol	9.45	0.45	5.0	ug/l	25.0		38	0.1-132	9	30	
Acenaphthene	22.4	0.38	1.0	ug/l	25.0		89	47-145	2	30	
Acenaphthylene	22.8	0.40	1.0	ug/l	25.0		91	33-145	2	30	
Anthracene	22.0	0.34	1.0	ug/l	25.0		88	27-133	2	30	
Benzo (a) anthracene	23.3	0.19	1.0	ug/l	25.0		93	33-143	6	30	
Benzo (a) pyrene	27.3	0.13	1.0	ug/l	25.0		109	17-163	11	30	
Benzo (b) fluoranthene	29.5	0.14	1.0	ug/l	25.0		118	24-159	21	30	
Benzo (g,h,i) perylene	31.1	0.10	2.0	ug/l	25.0		124	0.1-219	4	30	
Benzo (k) fluoranthene	24.2	0.22	1.0	ug/l	25.0		97	11-162	4	30	

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W4I1158-BSD1)					Analyzed: 09/24/14 16:08						
Benzyl butyl phthalate	25.8	0.18	1.0	ug/l	25.0		103	0.1-152	6	30	
Bis(2-chloroethoxy)methane	19.2	0.25	1.0	ug/l	25.0		77	33-184	4	30	
Bis(2-chloroethyl)ether	18.1	0.27	1.0	ug/l	25.0		72	12-158	4	30	
Bis(2-chloroisopropyl)ether	18.2	0.38	1.0	ug/l	25.0		73	36-166	2	30	
Bis(2-ethylhexyl)phthalate	21.4	2.3	5.0	ug/l	25.0		86	8-158	13	30	
Butyl benzyl phthalate	25.8	0.18	1.0	ug/l	25.0		103	0.1-152	6	30	
Chrysene	22.2	0.19	1.0	ug/l	25.0		89	17-168	2	30	
Dibenzo (a,h) anthracene	26.5	0.080	2.0	ug/l	25.0		106	0.1-227	0.1	30	
Diethyl phthalate	21.8	0.15	1.0	ug/l	25.0		87	0.1-114	3	30	
Dimethyl phthalate	23.1	0.18	1.0	ug/l	25.0		92	0.1-112	5	30	
Di-n-butyl phthalate	28.1	0.24	1.0	ug/l	25.0		112	1-118	5	30	
Di-n-octyl phthalate	30.2	0.19	1.0	ug/l	25.0		121	4-146	10	30	
Fluoranthene	22.9	0.22	1.0	ug/l	25.0		91	26-137	2	30	
Fluorene	22.8	0.35	1.0	ug/l	25.0		91	59-121	1	30	
Hexachlorobenzene	19.9	0.49	1.0	ug/l	25.0		80	0.1-152	3	30	
Hexachlorobutadiene	17.8	0.47	1.0	ug/l	25.0		71	24-116	3	30	
Hexachlorocyclopentadiene	13.2	1.5	5.0	ug/l	25.0		53	0.1-81	10	30	
Hexachloroethane	15.5	0.52	1.0	ug/l	25.0		62	40-113	8	30	
Indeno (1,2,3-cd) pyrene	25.3	0.12	2.0	ug/l	25.0		101	0.1-171	0.6	30	
Isophorone	18.0	0.21	1.0	ug/l	25.0		72	21-196	3	30	
Naphthalene	20.1	0.49	1.0	ug/l	25.0		81	21-133	3	30	
Nitrobenzene	17.0	0.36	1.0	ug/l	25.0		68	35-180	1	30	
N-Nitrosodimethylamine	11.7	0.14	1.0	ug/l	25.0		47	15-59	6	30	
N-Nitrosodi-n-propylamine	18.6	0.26	1.0	ug/l	25.0		74	0.1-230	4	30	
N-Nitrosodiphenylamine	17.4	0.19	1.0	ug/l	25.0		70	42-90	5	30	
Pentachlorophenol	22.6	0.19	1.0	ug/l	25.0		91	14-176	4	30	
Phenanthrene	22.7	0.32	1.0	ug/l	25.0		91	54-120	0.1	30	
Phenol	7.40	0.16	1.0	ug/l	25.0		30	5-112	5	30	
Pyrene	23.8	0.25	1.0	ug/l	25.0		95	52-115	3	30	
Surr: 2,4,6-Tribromophenol	*37.8*			*ug/l*	*50.0*		*76*	*25-102*			
Surr: 2-Fluorobiphenyl	*20.3*			*ug/l*	*25.0*		*81*	*22-107*			
Surr: 2-Fluorophenol	*22.4*			*ug/l*	*50.0*		*45*	*3-74*			
Surr: Nitrobenzene-d5	*16.9*			*ug/l*	*25.0*		*68*	*27-111*			
Surr: Phenol-d5	*15.2*			*ug/l*	*50.0*		*30*	*0.1-53*			
Surr: Terphenyl-d14	*20.3*			*ug/l*	*25.0*		*81*	*28-113*			

Capco Analytical Services
1536 Eastman Avenue
Ventura CA, 93003

Date Received: 09/23/14 09:50
Date Reported: 09/30/14 14:45

Notes and Definitions

S-GC	Surrogate recovery outside of control limits due to a possible matrix effect. The data was accepted based on valid recovery of the remaining surrogate.
M-04	Due to the nature of matrix interferences, sample extract was diluted prior to analysis. The MDL and MRL were raised due to the dilution.
ND	NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL)
NR	Not Reportable
Dil	Dilution
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Sub	Subcontracted analysis, original report available upon request
MDL	Method Detection Limit
MDA	Minimum Detectable Activity
MRL	Method Reporting Limit

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California Department of Health Services.

The Reporting Limit (RL) is referenced as the Laboratory's Practical Quantitation Limit (PQL) or the Detection Limit for Reporting Purposes (DLR).

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1386 (626) 336-2139 FAX (626) 336-2634

Blank

142406

9/26

9/29

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to: Plains c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: JOSE PIMENTEL
PROJECT/CHARGE #: Produced water well sampling
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	NPDES DEFFUSER	grab	1	Date:9-18-14 Time:14:30	N/A	BSEE WATER SAMPLES ~~FOR~~ TESTING OF O&G, ~~METALS, SULFIDES, VOC'S & SVOC'S~~
2	NPDES DEFFUSER	grab	1	Date:9-18-14 Time:14:39	N/A	BSEE WATER SAMPLES FOR TESTING OF ~~O&G,~~ ~~METALS, SULFIDES, VOC'S~~ & SVOC'S
3	NPDES DEFFUSER	grab	1	Date:9-18-14 Time:14:42	N/A	BSEE WATER SAMPLES FOR TESTING OF ~~O&G,~~ ~~METALS, SULFIDES,~~ VOC'S ~~& SVOC'S~~
4	↓	grab	1	Date: 9-18-14 Time: 1442	N/A	EPA1665 Total Sulfides
5	↓	grab	1	Date: Time: 1442	N/A	EPA1665 Copper
6		grab	1	Date: Time:	N/A	EPA1665
7		grab	1	Date: Time:	N/A	EPA1665
8		grab	1	Date: Time:	N/A	EPA1665
9		grab	1	Date: Time:	N/A	EPA1665

O&G
625
602 (Benzene)
20 mg/L (MDL)
30 mg/L (MDL)

Comments: **Time and date each sample as collected. Include a field IR if possible. LTS will preserve.**

Relinquished by:	Date: 9-18-2014	
Received by:	Time: 1520	
Relinquished by:	Date: 09/19	
Received by:	Time: 8:00 am	
Relinquished by:	Date: 9-19	
Received by:	Time: 9:20 am	
Relinquished by:	Date:	
Received by:	Time:	

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 30, 2014
Laboratory Number: 142443
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On September 25, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142443-01
UNICEL OUT	142443-02*
UNICEL OUT	142443-03*
UNICEL OUT	142443-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142443
Analyst: GM

Date Sampled: 09/24/14
Date Received: 09/25/14
Date Analyzed: 09/29/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142443-01	Unicel Out	20	1	1	5

QUALITY CONTROL DATA

142443-MB	Method Blank	ND	1	1	5

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to** FM O&G s c/o S. Lawry	**Bill to:** Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 10/2

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services 10/3
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 9-24-14 Time: 1200	HCl	EPA 1664 ABS (17) IRC(18)
2		grab	1	1300		14243
3		grab	1	1400		
4		grab	1	1500		
						Field notes

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 9.25.14
Received by:	Time: 1520

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 3, 2014
Laboratory Number: 142475
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On September 30, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142475-01
UNICEL OUT	142475-02*
UNICEL OUT	142475-03*
UNICEL OUT	142475-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142475
Analyst: GM

Date Sampled: 09/29/14
Date Received: 09/30/14
Date Analyzed: 10/02/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142475-01	Unicel Out	13	1	1	5

QUALITY CONTROL DATA

142475-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

142475

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report t FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 10/7

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services 10/8
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 9.29.14 Time: 1600	HCl	EPA 1664 Abs (14) IR (15)
2		grab	1	1615		
3		grab	1	1630		
4		grab	1	1645		
						Field notes

Comments: Run #1. Hold rest.

Relinquished by: _____ Date: 9.30.14
Received by: _____ Time: 1600

Relinquished by: _____ Date: 9/30/14
Received by: _____ Time: 4:00 PM

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 14, 2014
Laboratory Number: 142566
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On October 8, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142566-01
UNICEL OUT	142566-02*
UNICEL OUT	142566-03*
UNICEL OUT	142566-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142566
Analyst: GM

Date Sampled: 10/07/14
Date Received: 10/08/14
Date Analyzed: 10/10/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142566-01	Unicel Out	7.6	1	1	5

QUALITY CONTROL DATA

142566-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 10/15

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services 10/16
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 10/7/14 Time: 1600	HCl	EPA 1664 Abs (09) IR (10)
2		grab	1	1615		142566
3		grab	1	1630		
4		grab	1	1645		
						Field notes
						Temp: 175 F.
						H2S: 26 k
						B-9 backing in service.

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 10-8-14
Received by:	Time: 1510

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 23, 2014
Laboratory Number: 142646
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On October 17, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142646-01
UNICEL OUT	142646-02*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142646
Analyst: GM

Date Sampled: 10/15/14
Date Received: 10/17/14
Date Analyzed: 10/20/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142646-01	Unicel Out	9.5	1	1	5

QUALITY CONTROL DATA

142646-MB	Method Blank	ND	1	1	5

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

Chain of Custody

142646

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: *Hermosa*
COLLECTOR: LTS
PROJECT/CHARGE # Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: *Capco Analytical Services*
REPORT TO: _____ PHONE: _____
COPIES TO: *Platform Supervisor* PHONE: *644-4560*
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris 10/24 10/27

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	*Unicel out*	*grab*	1	Date: 10/15/14 Time: 1600	HCl	*EPA 1664* Ab 5 (oo) IR(10)
2	↙	*grab*	1	*1600*	HCl	*duplicate*
						Field notes

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 10.17.14
Received by:	Time: 1050

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 28, 2014
Laboratory Number: 142696
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On October 23, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142696-01
UNICEL OUT	142696-02*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 1 page excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.
Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142696
Analyst: GM

Date Sampled: 10/22/14
Date Received: 10/23/14
Date Analyzed: 10/27/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142696-01	Unicel Out	13	1	1	5

QUALITY CONTROL DATA

142696-MB	Method Blank	ND	1	1	5

142696

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report t FM O&G c/o Steve Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455

10/30 10/31

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 10/22/14 Time: 1700	HCl	EPA 1664 Abs (08) IR (10)
2	Unicel out	grab	1	10/23/2014 620		No IR run
						Field Notes: Multiple shut downs (10/22) before I came onto the platform.
						Wells heading combined with well treatment issues (from chemical) made the water initially higher than
						trend (<IR 15). First part of NPDES collected @1700 on 10/22: platform immediately lost power and didn't
						regain power till +2100 that evening. Lost the ESP and with it the ability to reliably get water from the
						NPDES sample point, owing to flow irregularities. ESP to be back in service (10/23).

Comments: **Run #1. Hold #2.**

Relinquished by:	Date: 10-23-14
Received by:	Time: 1140

Relinquished by:	Date: 10-23-14
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: November 6, 2014
Laboratory Number: 142754
Project Name: PF Hermosa Weekly NPDES
Sampled by: Client

On October 29, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142754-01
UNICEL OUT	142754-02*
UNICEL OUT	142754-03*
UNICEL OUT	142754-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142754
Analyst: GM

Date Sampled: 10/28/14
Date Received: 10/29/14
Date Analyzed: 11/03/14
Sample Matrix: Water

OIL & GREASE ANALYSIS
EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142754-01	Unicel Out	6.2	1	1	5

QUALITY CONTROL DATA

142754-MB	Method Blank	ND	1	1	5

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G c/o Steve Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002 11/5

11/6

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: Weekly NPDES
RESULTS REQUIRED: Normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	Unicel out	grab	1	Date: 10/28/14 Time: 1145	HCl	EPA 1664 Abs (08) IR (10)
2			1	1215		Abs (10) IR (12)
3			1	1245		142754
4			1	1315		

Comments: Run #1, Hold #2-4

Relinquished by: _____ Date: 10.29.14
Received by: _____ Time: 930

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

Relinquished by: _____ Date: _____
Received by: _____ Time: _____

aquatic bioassay & consulting laboratories, inc

September 10, 2014

Freeport -McMoRan Oil & Gas
Attn: Ruth Juris
201 S. Broadway
Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995* "All acceptability criteria were met. This is a valid test." Results were as follows:

CLIENT:	Freeport -McMoRan Oil & Gas
SAMPLE I.D.:	Produced Water Discharge (Platform Hermosa)
DATE RECEIVED:	13 Aug - 14
ABC LAB. NO.:	LTS0814.151

CHRONIC TOPSMELT SURVIVAL & GROWTH BIOASSAY

IWC CONCENTRATION = 0.0479 %

TST RESULT

SURVIVAL	PASS
GROWTH	PASS

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	13-3920-0167	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	13 Aug-14 15:01	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	20 Aug-14 13:05	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	16-7163-2259	**Code:**	LTS0814.151tops	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	30h (1.8 °C)	**Station:**	Platform Hermosa		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
16-5501-7449	7d Survival Rate	0.0719	>0.0719	NA	NA	1391	Steel Many-One Rank Sum Test
17-3093-9101	Mean Dry Biomass-mg	0.0719	>0.0719	NA	19.3%	1391	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
00-4291-7886	7d Survival Rate	EC5	>0.0719	N/A	N/A	<1391	Linear Interpolation (ICPIN)
		EC10	>0.0719	N/A	N/A	<1391	
		EC15	>0.0719	N/A	N/A	<1391	
		EC20	>0.0719	N/A	N/A	<1391	
		EC25	>0.0719	N/A	N/A	<1391	
		EC40	>0.0719	N/A	N/A	<1391	
		EC50	>0.0719	N/A	N/A	<1391	
10-9180-9160	Mean Dry Biomass-mg	IC5	>0.0719	N/A	N/A	<1391	Linear Interpolation (ICPIN)
		IC10	>0.0719	N/A	N/A	<1391	
		IC15	>0.0719	N/A	N/A	<1391	
		IC20	>0.0719	N/A	N/A	<1391	
		IC25	>0.0719	N/A	N/A	<1391	
		IC40	>0.0719	N/A	N/A	<1391	
		IC50	>0.0719	N/A	N/A	<1391	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
00-4291-7886	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
16-5501-7449	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
10-9180-9160	Mean Dry Biomass-mg	Control Resp	1.11	0.85 - NL	Yes	Passes Acceptability Criteria
17-3093-9101	Mean Dry Biomass-mg	Control Resp	1.11	0.85 - NL	Yes	Passes Acceptability Criteria
17-3093-9101	Mean Dry Biomass-mg	PMSD	0.1925	NL - 0.5	No	Passes Acceptability Criteria

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
0.024		5	1	1	1	1	1	0	0	0.0%	0.0%
0.0479		5	1	1	1	1	1	0	0	0.0%	0.0%
0.0719		5	1	1	1	1	1	0	0	0.0%	0.0%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.11	1.001	1.22	1.01	1.23	0.03938	0.08805	7.93%	0.0%
0.024		5	1.116	0.8967	1.335	0.94	1.376	0.07898	0.1766	15.82%	-0.5%
0.0479		5	1.351	1.262	1.439	1.272	1.428	0.03181	0.07113	5.27%	-21.65%
0.0719		5	1.292	1.02	1.564	1.066	1.626	0.09813	0.2194	16.98%	-16.35%

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.024		1	1	1	1	1
0.0479		1	1	1	1	1
0.0719		1	1	1	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.16	1.106	1.01	1.046	1.23
0.024		0.94	0.982	1.376	1.2	1.082
0.0479		1.388	1.272	1.428	1.388	1.278
0.0719		1.302	1.34	1.066	1.126	1.626

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.024		5/5	5/5	5/5	5/5	5/5
0.0479		5/5	5/5	5/5	5/5	5/5
0.0719		5/5	5/5	5/5	5/5	5/5

CETIS Analytical Report

Test Code: LTS0814.151tops | 05-7921-8329

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	16-5501-7449	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	16-7163-2259	**Code:**	LTS0814.151tops	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	30h (1.8 °C)	**Station:**	Platform Hermosa		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	0.0719	>0.0719	NA	1391

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.024	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		0.0479	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		0.0719	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	3	65540	<0.0001	Significant Effect
Error	0	0	16			
Total	0		19			

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
0.024		5	1	1	1	1	1	1	0	0.0%	0.0%
0.0479		5	1	1	1	1	1	1	0	0.0%	0.0%
0.0719		5	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
0.024		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
0.0479		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
0.0719		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.024		1	1	1	1	1
0.0479		1	1	1	1	1
0.0719		1	1	1	1	1

Angular (Corrected) Transformed Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.345	1.345	1.345	1.345
0.024		1.345	1.345	1.345	1.345	1.345
0.0479		1.345	1.345	1.345	1.345	1.345
0.0719		1.345	1.345	1.345	1.345	1.345

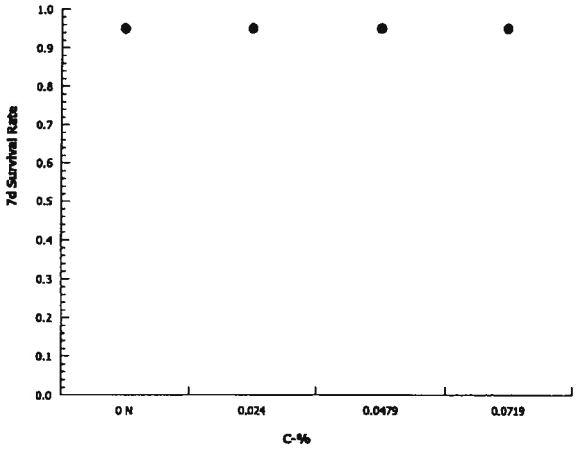
7d Survival Rate Binomials

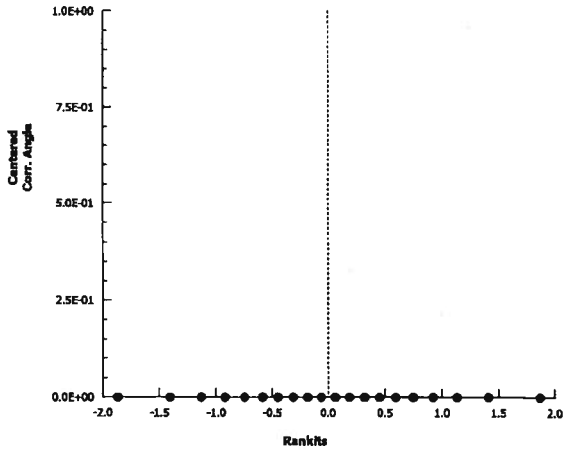
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.024		5/5	5/5	5/5	5/5	5/5
0.0479		5/5	5/5	5/5	5/5	5/5
0.0719		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test | **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	16-5501-7449	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-3093-9101	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	16-7163-2259	**Code:**	LTS0814.151tops	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	30h (1.8 °C)	**Station:**	Platform Hermosa		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	19.3%	0.0719	>0.0719	NA	1391

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.024	-0.05834	2.227	0.214	8	0.7704	CDF	Non-Significant Effect
		0.0479	-2.504	2.227	0.214	8	0.9992	CDF	Non-Significant Effect
		0.0719	-1.892	2.227	0.214	8	0.9960	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.2254582	0.07515272	3	3.262	0.0490	Significant Effect
Error	0.3685841	0.0230365	16			
Total	0.5940422		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.669	11.34	0.1289	Equal Variances
Variances	Mod Levene Equality of Variance	2.273	5.953	0.1323	Equal Variances
Variances	Levene Equality of Variance	1.727	5.292	0.2017	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.956	0.866	0.4678	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1232	0.2235	0.6164	Normal Distribution
Distribution	D'Agostino Skewness	1.375	2.576	0.1692	Normal Distribution
Distribution	D'Agostino Kurtosis	0.8997	2.576	0.3683	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	2.699	9.21	0.2593	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.36	3.878	0.4529	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1.11	1.001	1.22	1.106	1.01	1.23	0.03938	7.93%	0.0%
0.024		5	1.116	0.8967	1.335	1.082	0.94	1.376	0.07898	15.82%	-0.5%
0.0479		5	1.351	1.262	1.439	1.388	1.272	1.428	0.03181	5.27%	-21.65%
0.0719		5	1.292	1.02	1.564	1.302	1.066	1.626	0.09813	16.98%	-16.35%

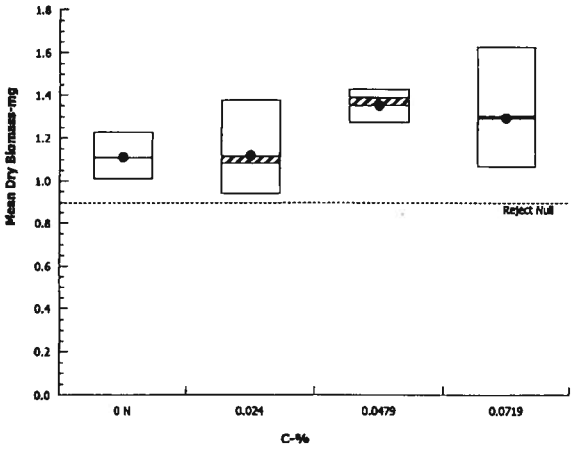
Mean Dry Biomass-mg Detail

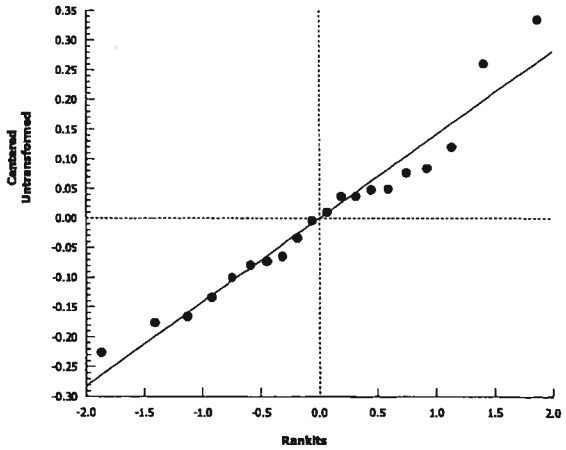
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.16	1.106	1.01	1.046	1.23
0.024		0.94	0.982	1.376	1.2	1.082
0.0479		1.388	1.272	1.428	1.388	1.278
0.0719		1.302	1.34	1.066	1.126	1.626

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-3093-9101	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	00-4291-7886	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	16-7163-2259	**Code:**	LTS0814.151tops	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	30h (1.8 °C)	**Station:**	Platform Hermosa		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>0.0719	N/A	N/A	<1391	NA	NA
EC10	>0.0719	N/A	N/A	<1391	NA	NA
EC15	>0.0719	N/A	N/A	<1391	NA	NA
EC20	>0.0719	N/A	N/A	<1391	NA	NA
EC25	>0.0719	N/A	N/A	<1391	NA	NA
EC40	>0.0719	N/A	N/A	<1391	NA	NA
EC50	>0.0719	N/A	N/A	<1391	NA	NA

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	25	25
0.024		5	1	1	1	0	0	0.0%	0.0%	25	25
0.0479		5	1	1	1	0	0	0.0%	0.0%	25	25
0.0719		5	1	1	1	0	0	0.0%	0.0%	25	25

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.024		1	1	1	1	1
0.0479		1	1	1	1	1
0.0719		1	1	1	1	1

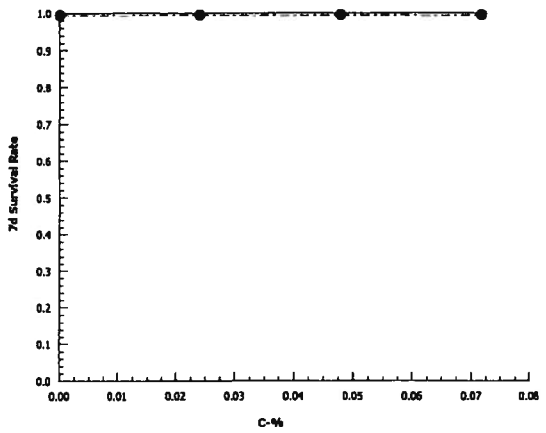
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.024		5/5	5/5	5/5	5/5	5/5
0.0479		5/5	5/5	5/5	5/5	5/5
0.0719		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	00-4291-7886	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Analytical Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	10-9180-9160	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	16-7163-2259	**Code:**	LTS0814.151tops	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	30h (1.8 °C)	**Station:**	Platform Hermosa		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	183119	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>0.0719	N/A	N/A	<1391	NA	NA
IC10	>0.0719	N/A	N/A	<1391	NA	NA
IC15	>0.0719	N/A	N/A	<1391	NA	NA
IC20	>0.0719	N/A	N/A	<1391	NA	NA
IC25	>0.0719	N/A	N/A	<1391	NA	NA
IC40	>0.0719	N/A	N/A	<1391	NA	NA
IC50	>0.0719	N/A	N/A	<1391	NA	NA

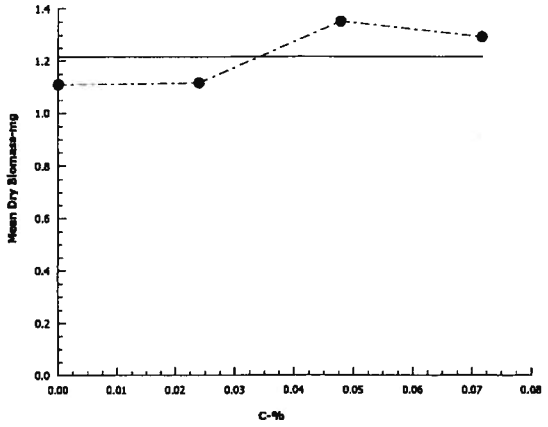
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.11	1.01	1.23	0.03938	0.08805	7.93%	0.0%
0.024		5	1.116	0.94	1.376	0.07898	0.1766	15.82%	-0.5%
0.0479		5	1.351	1.272	1.428	0.03181	0.07113	5.27%	-21.65%
0.0719		5	1.292	1.066	1.626	0.09813	0.2194	16.98%	-16.35%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.16	1.106	1.01	1.046	1.23
0.024		0.94	0.982	1.376	1.2	1.082
0.0479		1.388	1.272	1.428	1.388	1.278
0.0719		1.302	1.34	1.066	1.126	1.626

Graphics



CETIS Measurement Report

Test Code: LTS0814.151tops | 05-7921-8329

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	13-3920-0167	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	13 Aug-14 15:01	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	20 Aug-14 13:05	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	16-7163-2259	**Code:**	LTS0814.151tops	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	30h (1.8 °C)	**Station:**	Platform Hermosa		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	6.338	5.512	7.163	4.5	8.1	0.3489	0.987	15.57%	0
0.024		8	5.738	5.001	6.474	4	6.7	0.3116	0.8815	15.36%	0
0.0479		8	5.625	4.845	6.405	4	6.7	0.3299	0.9331	16.59%	0
0.0719		8	5.6	4.717	6.483	4	6.8	0.3732	1.056	18.85%	0
Overall		32	5.825			4	8.1				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.488	7.383	7.592	7.4	7.7	0.04407	0.1246	1.67%	0
0.024		8	7.5	7.437	7.563	7.4	7.6	0.02673	0.07559	1.01%	0
0.0479		8	7.488	7.434	7.541	7.4	7.6	0.02266	0.06409	0.86%	0
0.0719		8	7.488	7.434	7.541	7.4	7.6	0.02266	0.06409	0.86%	0
Overall		32	7.491			7.4	7.7				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
0.024		8	34	34	34	34	34	0	0	0.0%	0
0.0479		8	34	34	34	34	34	0	0	0.0%	0
0.0719		8	34	34	34	34	34	0	0	0.0%	0
Overall		32	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	21	21	21	21	21	0	0	0.0%	0
0.024		8	21	21	21	21	21	0	0	0.0%	0
0.0479		8	21	21	21	21	21	0	0	0.0%	0
0.0719		8	21	21	21	21	21	0	0	0.0%	0
Overall		32	21			21	21				0 (0%)

Pacific Topsmelt 7-d Survival and Growth Test **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	6.3	8.1	6.2	6.5	6.8	6.1	6.2	4.5
0.024		6.4	6.5	5.4	6.1	6.7	5.4	5.4	4
0.0479		6.3	6.5	5.4	6.1	6.7	5.1	4.9	4
0.0719		6.5	6.8	5.1	6.1	6.7	4.8	4.8	4

pH-Units

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.4	7.4	7.6	7.6	7.7	7.4	7.4	7.4
0.024		7.5	7.5	7.6	7.6	7.5	7.4	7.5	7.4
0.0479		7.5	7.5	7.6	7.5	7.5	7.4	7.5	7.4
0.0719		7.5	7.5	7.6	7.5	7.5	7.4	7.5	7.4

Salinity-ppt

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
0.024		34	34	34	34	34	34	34	34
0.0479		34	34	34	34	34	34	34	34
0.0719		34	34	34	34	34	34	34	34

Temperature-°C

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
0.024		21	21	21	21	21	21	21	21
0.0479		21	21	21	21	21	21	21	21
0.0719		21	21	21	21	21	21	21	21

aquatic bioassay & consulting laboratories, inc

September 10, 2014

Freeport -McMoRan Oil & Gas
Attn: Ruth Juris
201 S. Broadway
Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995* . Results were as follows:

CLIENT:	Freeport -McMoRan Oil & Gas
SAMPLE I.D.:	Produced Water Discharge (Platform Hermosa)
DATE RECEIVED:	13 Aug - 14
ABC LAB. NO.:	LTS0814.151

CHRONIC ABALONE LARVAL DEVELOPMENT BIOASSAY

IWC CONCENTRATION = 0.0479 %

TST RESULT

PASS

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Test Code: LTS0814.151abs | 11-6027-3066

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	15-6036-7021	**Test Type:**	Development	**Analyst:**	
Start Date:	13 Aug-14 12:02	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	15 Aug-14 12:00	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	
Sample ID:	02-2133-9532	**Code:**	LTS0814.151abs	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	27h (1.8 °C)	**Station:**	Platform Hermosa		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
13-1126-4472	Proportion Normal	0.0719	>0.0719	NA	NA	1391	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
11-3129-1619	Proportion Normal	EC5	>0.0719	N/A	N/A	<1391	Linear Interpolation (ICPIN)
		EC10	>0.0719	N/A	N/A	<1391	
		EC15	>0.0719	N/A	N/A	<1391	
		EC20	>0.0719	N/A	N/A	<1391	
		EC25	>0.0719	N/A	N/A	<1391	
		EC40	>0.0719	N/A	N/A	<1391	
		EC50	>0.0719	N/A	N/A	<1391	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
11-3129-1619	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
13-1126-4472	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria

Proportion Normal Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
0.024		5	1	1	1	1	1	0	0	0.0%	0.0%
0.0479		5	1	1	1	1	1	0	0	0.0%	0.0%
0.0719		5	1	1	1	1	1	0	0	0.0%	0.0%

Proportion Normal Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.024		1	1	1	1	1
0.0479		1	1	1	1	1
0.0719		1	1	1	1	1

Proportion Normal Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
0.024		100/100	100/100	100/100	100/100	100/100
0.0479		100/100	100/100	100/100	100/100	100/100
0.0719		100/100	100/100	100/100	100/100	100/100

Analyst:_____ QA: PASS

CETIS Analytical Report

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	13-1126-4472	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:48	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	02-2133-9532	**Code:**	LTS0814.151abs	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	27h (1.8 °C)	**Station:**	Platform Hermosa		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	0.0719	>0.0719	NA	1391

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.024	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		0.0479	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		0.0719	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	3	65540	<0.0001	Significant Effect
Error	0	0	16			
Total	0		19			

Proportion Normal Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
0.024		5	1	1	1	1	1	1	0	0.0%	0.0%
0.0479		5	1	1	1	1	1	1	0	0.0%	0.0%
0.0719		5	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.024		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.0479		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.0719		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%

Proportion Normal Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.024		1	1	1	1	1
0.0479		1	1	1	1	1
0.0719		1	1	1	1	1

Angular (Corrected) Transformed Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.521	1.521	1.521	1.521	1.521
0.024		1.521	1.521	1.521	1.521	1.521
0.0479		1.521	1.521	1.521	1.521	1.521
0.0719		1.521	1.521	1.521	1.521	1.521

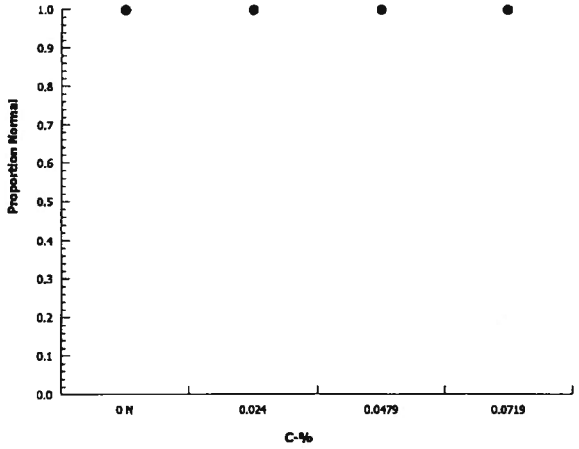
Proportion Normal Binomials

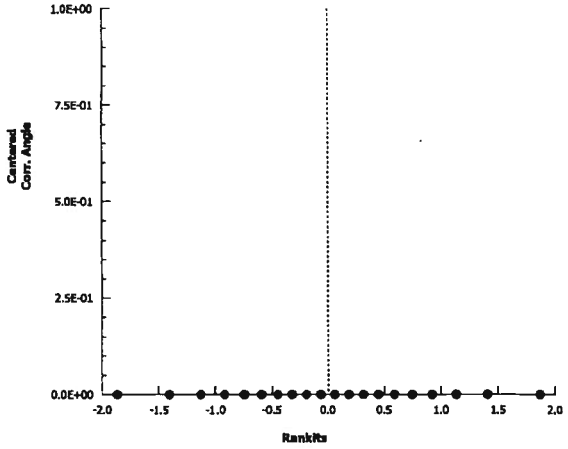
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
0.024		100/100	100/100	100/100	100/100	100/100
0.0479		100/100	100/100	100/100	100/100	100/100
0.0719		100/100	100/100	100/100	100/100	100/100

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	13-1126-4472	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:48	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Test Code: LTS0814.151abs | 11-6027-3066

Red Abalone Larval Development Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	11-3129-1619	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:48	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	02-2133-9532	**Code:**	LTS0814.151abs	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	27h (1.8 °C)	**Station:**	Platform Hermosa		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>0.0719	N/A	N/A	<1391	NA	NA
EC10	>0.0719	N/A	N/A	<1391	NA	NA
EC15	>0.0719	N/A	N/A	<1391	NA	NA
EC20	>0.0719	N/A	N/A	<1391	NA	NA
EC25	>0.0719	N/A	N/A	<1391	NA	NA
EC40	>0.0719	N/A	N/A	<1391	NA	NA
EC50	>0.0719	N/A	N/A	<1391	NA	NA

Proportion Normal Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	500	500
0.024		5	1	1	1	0	0	0.0%	0.0%	500	500
0.0479		5	1	1	1	0	0	0.0%	0.0%	500	500
0.0719		5	1	1	1	0	0	0.0%	0.0%	500	500

Proportion Normal Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.024		1	1	1	1	1
0.0479		1	1	1	1	1
0.0719		1	1	1	1	1

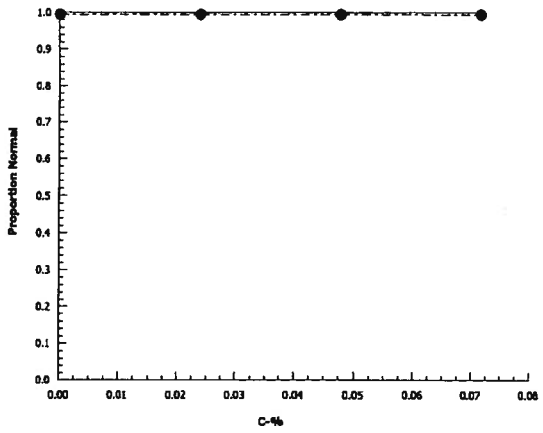
Proportion Normal Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
0.024		100/100	100/100	100/100	100/100	100/100
0.0479		100/100	100/100	100/100	100/100	100/100
0.0719		100/100	100/100	100/100	100/100	100/100

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	11-3129-1619	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:48	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Measurement Report

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	15-6036-7021	**Test Type:**	Development	**Analyst:**	
Start Date:	13 Aug-14 12:02	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	15 Aug-14 12:00	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	
Sample ID:	02-2133-9532	**Code:**	LTS0814.151abs	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	27h (1.8 °C)	**Station:**	Platform Hermosa		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.3	14.5	14 - 16	Yes	Results Within Limits

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	5.9	-2.994	14.79	5.2	6.6	0.7	0.9899	16.78%	0
0.024		2	6.2	3.659	8.741	6	6.4	0.2	0.2828	4.56%	0
0.0479		2	6.35	4.444	8.256	6.2	6.5	0.15	0.2121	3.34%	0
0.0719		2	6.55	5.915	7.185	6.5	6.6	0.04999	0.0707	1.08%	0
Overall		8	6.25			5.2	6.6				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.4	7.389	7.411	7.4	7.4	0	0	0.0%	0
0.024		2	7.45	6.815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
0.0479		2	7.55	6.915	8.185	7.5	7.6	0.05	0.07071	0.94%	0
0.0719		2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
Overall		8	7.475			7.4	7.6				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.024		2	34	34	34	34	34	0	0	0.0%	0
0.0479		2	34	34	34	34	34	0	0	0.0%	0
0.0719		2	34	34	34	34	34	0	0	0.0%	0
Overall		8	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
0.024		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
0.0479		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
0.0719		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
Overall		8	14.4			14.3	14.5				0 (0%)

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.6	5.2
0.024		6.4	6
0.0479		6.5	6.2
0.0719		6.6	6.5

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.4	7.4
0.024		7.4	7.5
0.0479		7.5	7.6
0.0719		7.5	7.5

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.024		34	34
0.0479		34	34
0.0719		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.5	14.3
0.024		14.5	14.3
0.0479		14.5	14.3
0.0719		14.5	14.3

aquatic bioassay & consulting laboratories, inc

September 10, 2014

Freeport -McMoRan Oil & Gas
Attn: Ruth Juris
201 S. Broadway
Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995* . Results were as follows:

CLIENT:	Freeport -McMoRan Oil & Gas
SAMPLE I.D.:	Produced Water Discharge (Platform Hermosa)
DATE RECEIVED:	13 Aug - 14
ABC LAB. NO.:	LTS0814.151

CHRONIC KELP GERMINATION AND GROWTH BIOASSAY

IWC CONCENTRATION = 0.0479 %

TST RESULT

Germination	PASS
Tube Length	PASS

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	03-6482-8871	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	13 Aug-14 14:02	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Receiving Water
Ending Date:	15 Aug-14 14:02	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Aquatic Bioassay Labs Collection	**Age:**	
Sample ID:	07-1780-2428	**Code:**	LTS0814.151klp	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	29h (1.8 °C)	**Station:**	Platform Hermosa		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
10-6237-8271	Germination Rate	0.0719	>0.0719	NA	2.47%	1391	Dunnett Multiple Comparison Test
04-3978-1407	Mean Length	0.0719	>0.0719	NA	4.01%	1391	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
21-3635-1271	Germination Rate	EC5	>0.0719	N/A	N/A	<1391	Linear Interpolation (ICPIN)
		EC10	>0.0719	N/A	N/A	<1391	
		EC15	>0.0719	N/A	N/A	<1391	
		EC20	>0.0719	N/A	N/A	<1391	
		EC25	>0.0719	N/A	N/A	<1391	
		EC40	>0.0719	N/A	N/A	<1391	
		EC50	>0.0719	N/A	N/A	<1391	
16-2909-2195	Mean Length	IC5	>0.0719	N/A	N/A	<1391	Linear Interpolation (ICPIN)
		IC10	>0.0719	N/A	N/A	<1391	
		IC15	>0.0719	N/A	N/A	<1391	
		IC20	>0.0719	N/A	N/A	<1391	
		IC25	>0.0719	N/A	N/A	<1391	
		IC40	>0.0719	N/A	N/A	<1391	
		IC50	>0.0719	N/A	N/A	<1391	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
10-6237-8271	Germination Rate	Control Resp	0.924	0.7 - NL	Yes	Passes Acceptability Criteria
21-3635-1271	Germination Rate	Control Resp	0.924	0.7 - NL	Yes	Passes Acceptability Criteria
04-3978-1407	Mean Length	Control Resp	16.02	10 - NL	Yes	Passes Acceptability Criteria
16-2909-2195	Mean Length	Control Resp	16.02	10 - NL	Yes	Passes Acceptability Criteria
10-6237-8271	Germination Rate	PMSD	0.02468	NL - 0.2	No	Passes Acceptability Criteria
04-3978-1407	Mean Length	PMSD	0.04005	NL - 0.2	No	Passes Acceptability Criteria

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.924	0.9098	0.9382	0.91	0.94	0.005099	0.0114	1.23%	0.0%
0.024		5	0.934	0.9198	0.9482	0.92	0.95	0.005099	0.0114	1.22%	-1.08%
0.0479		5	0.934	0.9083	0.9597	0.91	0.96	0.009274	0.02074	2.22%	-1.08%
0.0719		5	0.936	0.9218	0.9502	0.92	0.95	0.005099	0.0114	1.22%	-1.3%

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.02	15.3	16.74	15.5	16.7	0.2596	0.5805	3.62%	0.0%
0.024		5	16.48	15.93	17.03	16	17.1	0.1985	0.4438	2.69%	-2.87%
0.0479		5	16.14	15.65	16.63	15.7	16.6	0.1749	0.3912	2.42%	-0.75%
0.0719		5	16.24	15.77	16.71	15.8	16.6	0.1691	0.3782	2.33%	-1.37%

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.94	0.92	0.93	0.91	0.92
0.024		0.93	0.95	0.92	0.93	0.94
0.0479		0.95	0.96	0.92	0.93	0.91
0.0719		0.93	0.94	0.95	0.92	0.94

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	16.7	15.7	15.5	16.6	15.6
0.024		16.6	17.1	16.6	16	16.1
0.0479		15.7	16.5	16.6	15.9	16
0.0719		16.3	15.9	15.8	16.6	16.6

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	94/100	92/100	93/100	91/100	92/100
0.024		93/100	95/100	92/100	93/100	94/100
0.0479		95/100	96/100	92/100	93/100	91/100
0.0719		93/100	94/100	95/100	92/100	94/100

CETIS Analytical Report

Test Code: LTS0814.151klp | 03-9930-0912

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	10-6237-8271	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	07-1780-2428	**Code:**	LTS0814.151klp	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	29h (1.8 °C)	**Station:**	Platform Hermosa		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	2.47%	0.0719	>0.0719	NA	1391

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.024	-1.065	2.227	0.041	8	0.9673	CDF	Non-Significant Effect
		0.0479	-1.165	2.227	0.041	8	0.9741	CDF	Non-Significant Effect
		0.0719	-1.285	2.227	0.041	8	0.9807	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.001790849	0.0005969495	3	0.7025	0.5643	Non-Significant Effect
Error	0.01359634	0.0008497711	16			
Total	0.01538719		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.57	11.34	0.4628	Equal Variances
Variances	Mod Levene Equality of Variance	1.507	5.953	0.2629	Equal Variances
Variances	Levene Equality of Variance	2.163	5.292	0.1323	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9641	0.866	0.6287	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1685	0.2235	0.1426	Normal Distribution
Distribution	D'Agostino Skewness	0.594	2.576	0.5525	Normal Distribution
Distribution	D'Agostino Kurtosis	0.3603	2.576	0.7186	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.4827	9.21	0.7856	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.4092	3.878	0.3495	Normal Distribution

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.924	0.9098	0.9382	0.92	0.91	0.94	0.005099	1.23%	0.0%
0.024		5	0.934	0.9198	0.9482	0.93	0.92	0.95	0.005099	1.22%	-1.08%
0.0479		5	0.934	0.9083	0.9597	0.93	0.91	0.96	0.009274	2.22%	-1.08%
0.0719		5	0.936	0.9218	0.9502	0.94	0.92	0.95	0.005099	1.22%	-1.3%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.292	1.265	1.319	1.284	1.266	1.323	0.009748	1.69%	0.0%
0.024		5	1.312	1.283	1.341	1.303	1.284	1.345	0.01044	1.78%	-1.52%
0.0479		5	1.314	1.26	1.367	1.303	1.266	1.369	0.01919	3.27%	-1.66%
0.0719		5	1.316	1.287	1.345	1.323	1.284	1.345	0.01038	1.76%	-1.83%

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.94	0.92	0.93	0.91	0.92
0.024		0.93	0.95	0.92	0.93	0.94
0.0479		0.95	0.96	0.92	0.93	0.91
0.0719		0.93	0.94	0.95	0.92	0.94

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	10-6237-8271	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

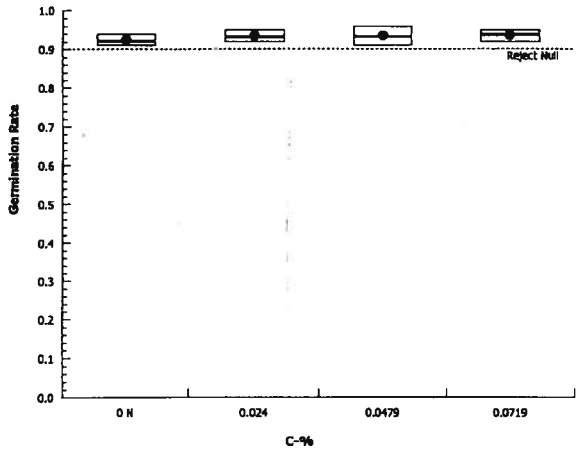
Angular (Corrected) Transformed Detail

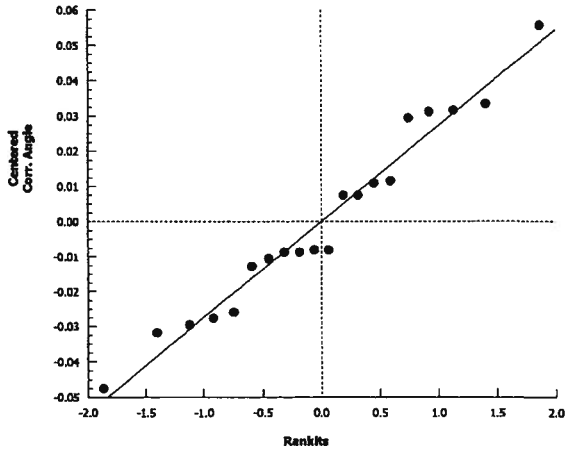
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.323	1.284	1.303	1.266	1.284
0.024		1.303	1.345	1.284	1.303	1.323
0.0479		1.345	1.369	1.284	1.303	1.266
0.0719		1.303	1.323	1.345	1.284	1.323

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	94/100	92/100	93/100	91/100	92/100
0.024		93/100	95/100	92/100	93/100	94/100
0.0479		95/100	96/100	92/100	93/100	91/100
0.0719		93/100	94/100	95/100	92/100	94/100

Graphics





Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	04-3978-1407	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	07-1780-2428	**Code:**	LTS0814.151klp	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	29h (1.8 °C)	**Station:**	Platform Hermosa		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	4.01%	0.0719	>0.0719	NA	1391

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.024	-1.597	2.227	0.642	8	0.9912	CDF	Non-Significant Effect
		0.0479	-0.4165	2.227	0.642	8	0.8732	CDF	Non-Significant Effect
		0.0719	-0.7636	2.227	0.642	8	0.9360	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.5720003	0.1906668	3	0.9189	0.4540	Non-Significant Effect
Error	3.320003	0.2075002	16			
Total	3.892003		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	0.8838	11.34	0.8293	Equal Variances
Variances	Mod Levene Equality of Variance	0.3254	5.953	0.8071	Equal Variances
Variances	Levene Equality of Variance	1.46	5.292	0.2628	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8922	0.866	0.0295	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.178	0.2235	0.0966	Normal Distribution
Distribution	D'Agostino Skewness	0.5773	2.576	0.5638	Normal Distribution
Distribution	D'Agostino Kurtosis	2.647	2.576	0.0081	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	7.338	9.21	0.0255	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.9053	3.878	0.0210	Normal Distribution

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	16.02	15.3	16.74	15.7	15.5	16.7	0.2596	3.62%	0.0%
0.024		5	16.48	15.93	17.03	16.6	16	17.1	0.1985	2.69%	-2.87%
0.0479		5	16.14	15.65	16.63	16	15.7	16.6	0.1749	2.42%	-0.75%
0.0719		5	16.24	15.77	16.71	16.3	15.8	16.6	0.1691	2.33%	-1.37%

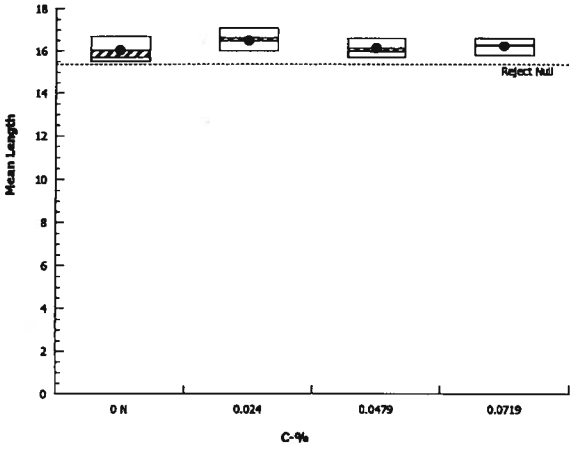
Mean Length Detail

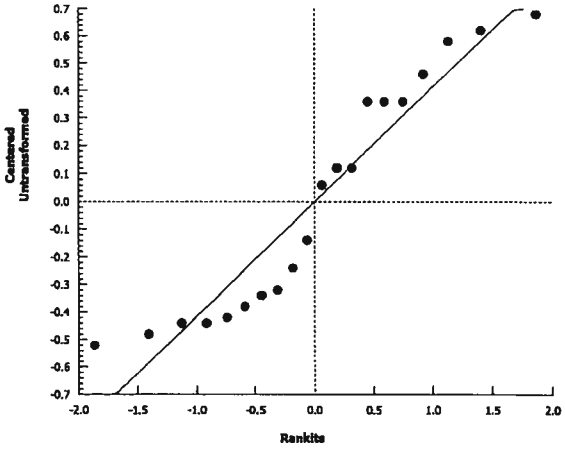
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	16.7	15.7	15.5	16.6	15.6
0.024		16.6	17.1	16.6	16	16.1
0.0479		15.7	16.5	16.6	15.9	16
0.0719		16.3	15.9	15.8	16.6	16.6

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	04-3978-1407	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Test Code: LTS0814.151klp | 03-9930-0912

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	21-3635-1271	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	07-1780-2428	**Code:**	LTS0814.151klp	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	29h (1.8 °C)	**Station:**	Platform Hermosa		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>0.0719	N/A	N/A	<1391	NA	NA
EC10	>0.0719	N/A	N/A	<1391	NA	NA
EC15	>0.0719	N/A	N/A	<1391	NA	NA
EC20	>0.0719	N/A	N/A	<1391	NA	NA
EC25	>0.0719	N/A	N/A	<1391	NA	NA
EC40	>0.0719	N/A	N/A	<1391	NA	NA
EC50	>0.0719	N/A	N/A	<1391	NA	NA

Germination Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.924	0.91	0.94	0.005099	0.0114	1.23%	0.0%	462	500
0.024		5	0.934	0.92	0.95	0.005099	0.0114	1.22%	-1.08%	467	500
0.0479		5	0.934	0.91	0.96	0.009274	0.02074	2.22%	-1.08%	467	500
0.0719		5	0.936	0.92	0.95	0.005099	0.0114	1.22%	-1.3%	468	500

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.94	0.92	0.93	0.91	0.92
0.024		0.93	0.95	0.92	0.93	0.94
0.0479		0.95	0.96	0.92	0.93	0.91
0.0719		0.93	0.94	0.95	0.92	0.94

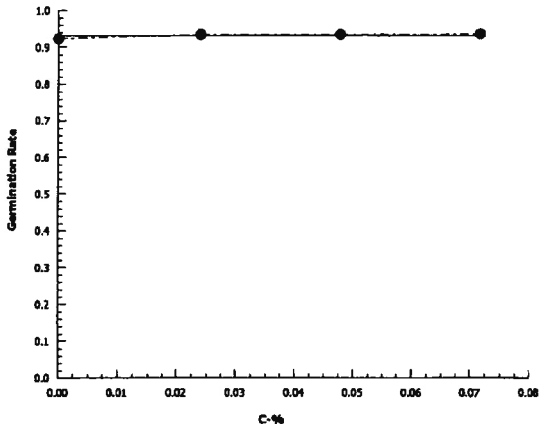
Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	94/100	92/100	93/100	91/100	92/100
0.024		93/100	95/100	92/100	93/100	94/100
0.0479		95/100	96/100	92/100	93/100	91/100
0.0719		93/100	94/100	95/100	92/100	94/100

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	21-3635-1271	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	16-2909-2195	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	07-1780-2428	**Code:**	LTS0814.151klp	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	29h (1.8 °C)	**Station:**	Platform Hermosa		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1733034	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>0.0719	N/A	N/A	<1391	NA	NA
IC10	>0.0719	N/A	N/A	<1391	NA	NA
IC15	>0.0719	N/A	N/A	<1391	NA	NA
IC20	>0.0719	N/A	N/A	<1391	NA	NA
IC25	>0.0719	N/A	N/A	<1391	NA	NA
IC40	>0.0719	N/A	N/A	<1391	NA	NA
IC50	>0.0719	N/A	N/A	<1391	NA	NA

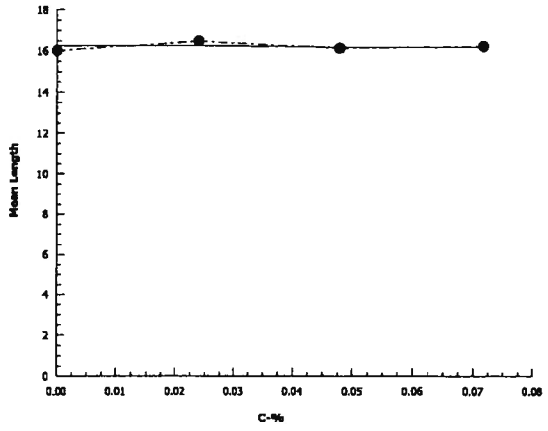
Mean Length Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.02	15.5	16.7	0.2596	0.5805	3.62%	0.0%
0.024		5	16.48	16	17.1	0.1985	0.4438	2.69%	-2.87%
0.0479		5	16.14	15.7	16.6	0.1749	0.3911	2.42%	-0.75%
0.0719		5	16.24	15.8	16.6	0.1691	0.3781	2.33%	-1.37%

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	16.7	15.7	15.5	16.6	15.6
0.024		16.6	17.1	16.6	16	16.1
0.0479		15.7	16.5	16.6	15.9	16
0.0719		16.3	15.9	15.8	16.6	16.6

Graphics



CETIS Measurement Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	03-6482-8871	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	13 Aug-14 14:02	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Receiving Water
Ending Date:	15 Aug-14 14:02	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Aquatic Bioassay Labs Collection	**Age:**	
Sample ID:	07-1780-2428	**Code:**	LTS0814.151klp	**Client:**	LTS Environmental, Inc.
Sample Date:	12 Aug-14 09:00	**Material:**	Sample Water	**Project:**	
Receive Date:	13 Aug-14 08:35	**Source:**	Bioassay Report		
Sample Age:	29h (1.8 °C)	**Station:**	Platform Hermosa		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
0.024		2	6.4	3.859	8.941	6.2	6.6	0.2	0.2828	4.42%	0
0.0479		2	6.55	3.373	9.727	6.3	6.8	0.25	0.3536	5.4%	0
0.0719		2	6.55	5.915	7.185	6.5	6.6	0.04999	0.0707	1.08%	0
Overall		8	6.475			6	6.8				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.024		2	8	8	8	8	8	0	0	0.0%	0
0.0479		2	8	8	8	8	8	0	0	0.0%	0
0.0719		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
Overall		8	7.988			7.9	8.1				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.024		2	34	34	34	34	34	0	0	0.0%	0
0.0479		2	34	34	34	34	34	0	0	0.0%	0
0.0719		2	34	34	34	34	34	0	0	0.0%	0
Overall		8	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
0.024		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
0.0479		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
0.0719		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
Overall		8	14.75			14.7	14.8				0 (0%)

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.8	6
0.024		6.6	6.2
0.0479		6.8	6.3
0.0719		6.6	6.5

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.024		8	8
0.0479		8	8
0.0719		8	8.1

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.024		34	34
0.0479		34	34
0.0719		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.7	14.8
0.024		14.7	14.8
0.0479		14.7	14.8
0.0719		14.7	14.8

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G Ruth Juris 201 S Broadway Orcutt, Ca 93455	**Bill to:** FM O&G 700 Milam, Suite 3100 Houston, Tx 77002

FACILITY: Platform Hermosa
COLLECTOR: LTS /
PROJECT/CHARGE #: Quarterly NPDES 3-species Toxicity
RESULTS REQUIRED: normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: ABC Lab
REPORT TO: George Folks PHONE: _____
FAX: _____
COPIES TO: *Steve Lawry @ LTS* PHONE: *644-4560*
Platform Supervisor PHONE: _____
(@ Orcutt) Ruth Juris

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	PRESERV.	ANALYSES REQUESTED (METHOD)
1	Produced Water Discharge	Comp	1 quart	8-11-12-14 1200 – 900	Ice	Red Abalone - Larval development Giant Kelp - Germination & germ tube length Top Smelt - Larval survival & growth
						IWC = .0479 1.5 x IWC = .0719 0.5 x IWC = .0240
						Composite times (3-hour intervals):
						1200 – 9am 1200/1500/1800
						2100/0000/300/600/
						900

Comments: _____

Relinquished by:		Date: 8-13-14	
Received by:		Time: 835	
Relinquished by:		Date:	
Received by:		Time:	

Relinquished by:		Date:	
Received by:		Time:	
Relinquished by:		Date:	
Received by:		Time:	

TEMP = 1.8°C
CHLORINE = 20.1
AMMONIA >W

aquatic bioassay & consulting laboratories, inc

CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY

DATE: 12 August - 2014

STANDARD TOXICANT: Copper Chloride

ENDPOINT: SURVIVAL

NOEC = 56.00 ug/l

EC25 = 79.10 ug/l
EC50 = 109.20 ug/l

ENDPOINT: GROWTH

NOEC = 56.00 ug/l

IC25 = 90.90 ug/l
IC50 = 122.70 ug/l

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	02-4919-6208	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	12 Aug-14 14:59	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	19 Aug-14 13:00	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	08-4869-1228	**Code:**	TOPS081214	**Client:**	ABC Labs
Sample Date:	12 Aug-14 14:59	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
09-5324-5788	7d Survival Rate	56	100	74.83	11.7%		Dunnett Multiple Comparison Test
14-4593-3685	Mean Dry Biomass-mg	56	100	74.83	17.4%		Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
07-2625-8159	7d Survival Rate	EC5	57.1	6.45	63.7		Linear Interpolation (ICPIN)
		EC10	62.6	38.7	69.2		
		EC15	68.1	56.14	74.7		
		EC20	73.6	63.7	80.2		
		EC25	79.1	69.95	85.7		
		EC40	95.6	85.7	102.2		
		EC50	109.2	92.63	118.5		
06-6398-2741	Mean Dry Biomass-mg	IC5	62.98	60.54	67.48		Linear Interpolation (ICPIN)
		IC10	69.96	65.07	78.97		
		IC15	76.94	69.69	90.45		
		IC20	83.92	74.26	101.9		
		IC25	90.9	78.82	109.5		
		IC40	110.4	93.23	123.8		
		IC50	122.7	107.5	133.9		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
07-2625-8159	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
09-5324-5788	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
06-6398-2741	Mean Dry Biomass-mg	Control Resp	1.152	0.85 - NL	Yes	Passes Acceptability Criteria
14-4593-3685	Mean Dry Biomass-mg	Control Resp	1.152	0.85 - NL	Yes	Passes Acceptability Criteria
09-5324-5788	7d Survival Rate	PMSD	0.117	NL - 0.25	No	Passes Acceptability Criteria
14-4593-3685	Mean Dry Biomass-mg	PMSD	0.1738	NL - 0.5	No	Passes Acceptability Criteria

7d Survival Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
56		5	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	4.0%
100		5	0.56	0.4489	0.6711	0.4	0.6	0.04	0.08944	15.97%	44.0%
180		5	0.04	0	0.1511	0	0.2	0.04	0.08944	223.6%	96.0%
320		5	0	0	0	0	0	0	0		100.0%
560		5	0	0	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.152	0.9868	1.317	0.988	1.298	0.0595	0.133	11.55%	0.0%
56		5	1.358	1.107	1.61	1.128	1.574	0.09056	0.2025	14.91%	-17.92%
100		5	0.8596	0.7165	1.003	0.678	0.98	0.05155	0.1153	13.41%	25.38%
180		5	0.042	-0.07461	0.1586	0	0.21	0.042	0.09391	223.6%	96.35%
320		5	0	0	0	0	0	0	0		100.0%
560		5	0	0	0	0	0	0	0		100.0%

Pacific Topsmelt 7-d Survival and Growth Test **Aquatic Bioassay & Consulting Labs, Inc.**

7d Survival Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
56		0.8	1	1	1	1
100		0.6	0.6	0.4	0.6	0.6
180		0.2	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

Mean Dry Biomass-mg Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.036	1.21	1.228	0.988	1.298
56		1.442	1.158	1.49	1.574	1.128
100		0.834	0.878	0.928	0.678	0.98
180		0.21	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		3/5	3/5	2/5	3/5	3/5
180		1/5	0/5	0/5	0/5	0/5
320		0/5	0/5	0/5	0/5	0/5
560		0/5	0/5	0/5	0/5	0/5

CETIS Analytical Report

Test Code: TOPS081214 | 18-1465-5774

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	09-5324-5788	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	03 Sep-14 15:15	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	08-4869-1228	**Code:**	TOPS081214	**Client:**	ABC Labs
Sample Date:	12 Aug-14 14:59	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	11.7%	56	100	74.83	

Dunnett Multiple Comparison Test

Control	vs	C-µg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		56	0.8583	2.227	0.124	8	0.3889	CDF	Non-Significant Effect
		100*	9.001	2.227	0.124	8	<0.0001	CDF	Significant Effect
		180*	19.32	2.227	0.124	8	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.728729	1.24291	3	161.5	<0.0001	Significant Effect
Error	0.1231686	0.00769804	16			
Total	3.851897		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	0.3392	5.953	0.7974	Equal Variances
Variances	Levene Equality of Variance	2.412	5.292	0.1047	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8744	0.866	0.0140	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.2271	0.2235	0.0081	Non-normal Distribution
Distribution	D'Agostino Skewness	0.8969	2.576	0.3698	Normal Distribution
Distribution	D'Agostino Kurtosis	1.842	2.576	0.0654	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	4.199	9.21	0.1225	Normal Distribution
Distribution	Anderson-Darling A2 Normality	1.292	3.878	0.0019	Non-normal Distribution

7d Survival Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
56		5	0.96	0.8489	1	1	0.8	1	0.04	9.32%	4.0%
100		5	0.56	0.4489	0.6711	0.6	0.4	0.6	0.04	15.97%	44.0%
180		5	0.04	0	0.1511	0	0	0.2	0.04	223.6%	96.0%
320		5	0	0	0	0	0	0	0		100.0%
560		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
56		5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	3.54%
100		5	0.8458	0.734	0.9576	0.8861	0.6847	0.8861	0.04027	10.65%	37.13%
180		5	0.2731	0.1409	0.4054	0.2255	0.2255	0.4636	0.04763	38.99%	79.7%
320		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0	0.0%	83.24%
560		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0	0.0%	83.24%

Analysis ID: 09-5324-5788 Endpoint: 7d Survival Rate CETIS Version: CETISv1.8.7
Analyzed: 03 Sep-14 15:15 Analysis: Parametric-Control vs Treatments Official Results: Yes

7d Survival Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
56		0.8	1	1	1	1
100		0.6	0.6	0.4	0.6	0.6
180		0.2	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

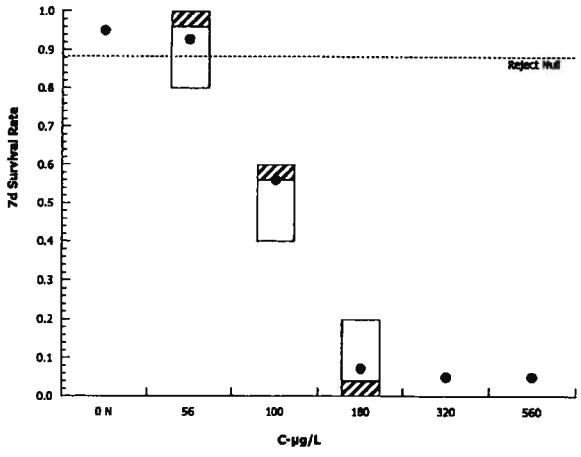
Angular (Corrected) Transformed Detail

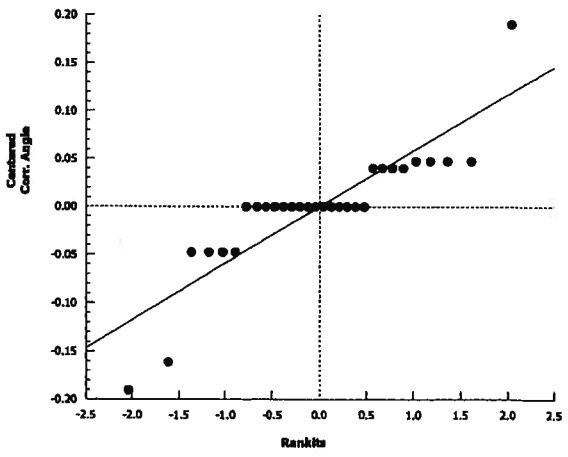
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.345	1.345	1.345	1.345
56		1.107	1.345	1.345	1.345	1.345
100		0.8861	0.8861	0.6847	0.8861	0.8861
180		0.4636	0.2255	0.2255	0.2255	0.2255
320		0.2255	0.2255	0.2255	0.2255	0.2255
560		0.2255	0.2255	0.2255	0.2255	0.2255

7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		3/5	3/5	2/5	3/5	3/5
180		1/5	0/5	0/5	0/5	0/5
320		0/5	0/5	0/5	0/5	0/5
560		0/5	0/5	0/5	0/5	0/5

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	14-4593-3685	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	03 Sep-14 15:15	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes
Sample ID:	08-4869-1228	Code:	TOPS081214	Client:	ABC Labs
Sample Date:	12 Aug-14 14:59	Material:	Copper chloride	Project:	REF TOX
Receive Date:		Source:	Reference Toxicant		
Sample Age:	NA	Station:	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	17.4%	56	100	74.83	

Dunnett Multiple Comparison Test

Control	vs	C-µg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		56	-2.296	2.227	0.200	8	0.9987	CDF	Non-Significant Effect
		100*	3.253	2.227	0.200	8	0.0066	CDF	Significant Effect
		180*	12.35	2.227	0.200	8	<0.0001	CDF	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.012974	1.670991	3	82.7	<0.0001	Significant Effect
Error	0.3232704	0.0202044	16			
Total	5.336244		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	2.436	11.34	0.4870	Equal Variances
Variances	Mod Levene Equality of Variance	1.396	5.953	0.2916	Equal Variances
Variances	Levene Equality of Variance	3.117	5.292	0.0555	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9574	0.866	0.4928	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1237	0.2235	0.6086	Normal Distribution
Distribution	D'Agostino Skewness	0.4957	2.576	0.6201	Normal Distribution
Distribution	D'Agostino Kurtosis	1.109	2.576	0.2675	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	1.475	9.21	0.4783	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.3696	3.878	0.4308	Normal Distribution

Mean Dry Biomass-mg Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1.152	0.9868	1.317	1.21	0.988	1.298	0.0595	11.55%	0.0%
56		5	1.358	1.107	1.61	1.442	1.128	1.574	0.09056	14.91%	-17.92%
100		5	0.8596	0.7165	1.003	0.878	0.678	0.98	0.05155	13.41%	25.38%
180		5	0.042	-0.07461	0.1586	0	0	0.21	0.042	223.6%	96.35%
320		5	0	0	0	0	0	0	0		100.0%
560		5	0	0	0	0	0	0	0		100.0%

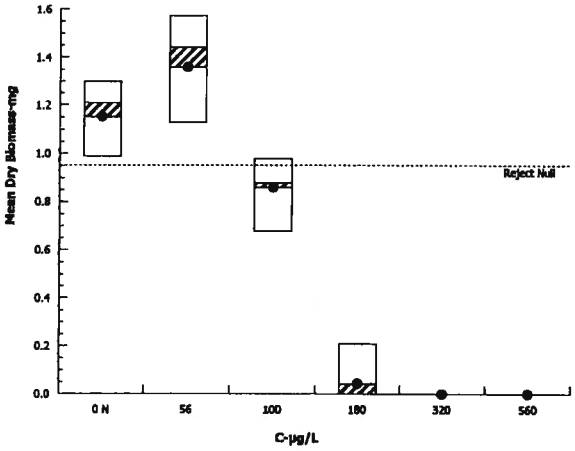
Mean Dry Biomass-mg Detail

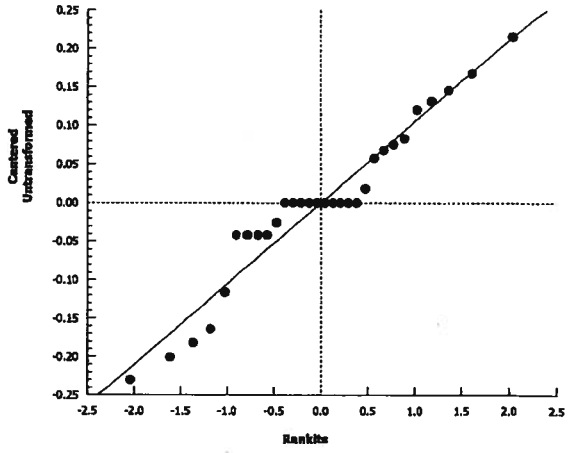
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.036	1.21	1.228	0.988	1.298
56		1.442	1.158	1.49	1.574	1.128
100		0.834	0.878	0.928	0.678	0.98
180		0.21	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	14-4593-3685	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	03 Sep-14 15:15	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	07-2625-8159	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	03 Sep-14 15:15	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	08-4869-1228	**Code:**	TOPS081214	**Client:**	ABC Labs
Sample Date:	12 Aug-14 14:59	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	57.1	6.45	63.7
EC10	62.6	38.7	69.2
EC15	68.1	56.14	74.7
EC20	73.6	63.7	80.2
EC25	79.1	69.95	85.7
EC40	95.6	85.7	102.2
EC50	109.2	92.63	118.5

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	25	25
56		5	0.96	0.8	1	0.04	0.08944	9.32%	4.0%	24	25
100		5	0.56	0.4	0.6	0.04	0.08944	15.97%	44.0%	14	25
180		5	0.04	0	0.2	0.04	0.08944	223.6%	96.0%	1	25
320		5	0	0	0	0	0		100.0%	0	25
560		5	0	0	0	0	0		100.0%	0	25

7d Survival Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
56		0.8	1	1	1	1
100		0.6	0.6	0.4	0.6	0.6
180		0.2	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

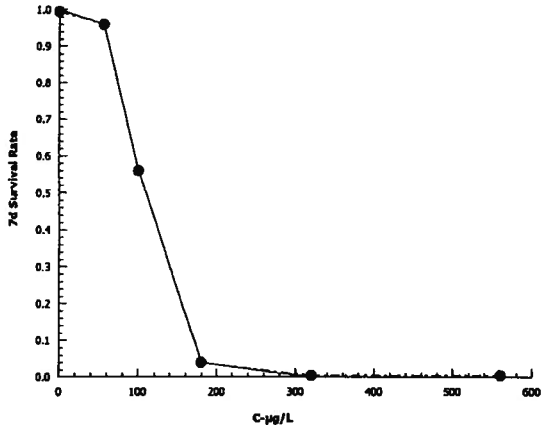
7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		3/5	3/5	2/5	3/5	3/5
180		1/5	0/5	0/5	0/5	0/5
320		0/5	0/5	0/5	0/5	0/5
560		0/5	0/5	0/5	0/5	0/5

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	07-2625-8159	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	03 Sep-14 15:15	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	06-6398-2741	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.8.7
Analyzed:	03 Sep-14 15:15	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Sample ID:	08-4869-1228	**Code:**	TOPS081214	**Client:**	ABC Labs
Sample Date:	12 Aug-14 14:59	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	244042	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	62.98	60.54	67.48
IC10	69.96	65.07	78.97
IC15	76.94	69.69	90.45
IC20	83.92	74.26	101.9
IC25	90.9	78.82	109.5
IC40	110.4	93.23	123.8
IC50	122.7	107.5	133.9

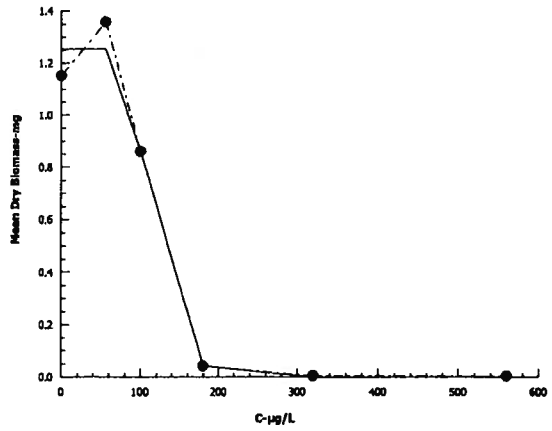
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.152	0.988	1.298	0.0595	0.133	11.55%	0.0%
56		5	1.358	1.128	1.574	0.09056	0.2025	14.91%	-17.92%
100		5	0.8596	0.678	0.98	0.05155	0.1153	13.41%	25.38%
180		5	0.042	0	0.21	0.042	0.09391	223.6%	96.35%
320		5	0	0	0	0	0		100.0%
560		5	0	0	0	0	0		100.0%

Mean Dry Biomass-mg Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.036	1.21	1.228	0.988	1.298
56		1.442	1.158	1.49	1.574	1.128
100		0.834	0.878	0.928	0.678	0.98
180		0.21	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

Graphics



CETIS Measurement Report

Pacific Topsmelt 7-d Survival and Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	02-4919-6208	**Test Type:**	Growth-Survival (7d)	**Analyst:**	
Start Date:	12 Aug-14 14:59	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	19 Aug-14 13:00	**Species:**	Atherinops affinis	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	08-4869-1228	**Code:**	TOPS081214	**Client:**	ABC Labs
Sample Date:	12 Aug-14 14:59	**Material:**	Copper chloride	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Dissolved Oxygen-mg/L

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	6.5	5.899	7.101	5.7	8.1	0.2542	0.7191	11.06%	0
56		8	6.3	5.918	6.682	5.6	7	0.1615	0.4567	7.25%	0
100		8	6.238	5.816	6.659	5.3	7	0.1782	0.5041	8.08%	0
180		8	6.275	5.979	6.571	5.7	6.8	0.125	0.3536	5.63%	0
320		5	6.32	5.703	6.937	5.7	7	0.2223	0.497	7.86%	0
560		2	6.4	3.859	8.941	6.2	6.6	0.2	0.2828	4.42%	0
Overall		39	6.339			5.3	8.1				0 (0%)

pH-Units

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.5	7.4	7.6	7.4	7.7	0.04226	0.1195	1.59%	0
56		8	7.525	7.428	7.622	7.4	7.7	0.04119	0.1165	1.55%	0
100		8	7.538	7.429	7.646	7.4	7.7	0.04605	0.1302	1.73%	0
180		8	7.55	7.45	7.65	7.4	7.7	0.04226	0.1195	1.58%	0
320		5	7.56	7.449	7.671	7.5	7.7	0.04	0.08944	1.18%	0
560		2	7.6	6.329	8.871	7.5	7.7	0.1	0.1414	1.86%	0
Overall		39	7.545			7.4	7.7				0 (0%)

Salinity-ppt

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
56		8	34	34	34	34	34	0	0	0.0%	0
100		8	34	34	34	34	34	0	0	0.0%	0
180		8	34	34	34	34	34	0	0	0.0%	0
320		5	34	34	34	34	34	0	0	0.0%	0
560		2	34	34	34	34	34	0	0	0.0%	0
Overall		39	34			34	34				0 (0%)

Temperature-°C

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	21	21	21	21	21	0	0	0.0%	0
56		8	21	21	21	21	21	0	0	0.0%	0
100		8	21	21	21	21	21	0	0	0.0%	0
180		8	21	21	21	21	21	0	0	0.0%	0
320		5	21	21	21	21	21	0	0	0.0%	0
560		2	21	21	21	21	21	0	0	0.0%	0
Overall		39	21			21	21				0 (0%)

Pacific Topsmelt 7-d Survival and Growth Test **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	6.3	6.3	8.1	6.2	6.5	6.8	6.1	5.7
56		6.3	6	7	5.6	6.5	6.8	6.2	6
100		6.2	5.3	7	6	6.2	6.7	6.4	6.1
180		6.4	6.2	6.8	5.7	6.1	6.7	6.2	6.1
320		6.6	6.2	7	5.7	6.1			
560		6.6	6.2						

pH-Units

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.5	7.4	7.4	7.6	7.6	7.7	7.4	7.4
56		7.6	7.5	7.4	7.6	7.6	7.7	7.4	7.4
100		7.7	7.5	7.4	7.6	7.6	7.7	7.4	7.4
180		7.7	7.5	7.5	7.6	7.6	7.7	7.4	7.4
320		7.7	7.5	7.5	7.6	7.5			
560		7.7	7.5						

Salinity-ppt

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
56		34	34	34	34	34	34	34	34
100		34	34	34	34	34	34	34	34
180		34	34	34	34	34	34	34	34
320		34	34	34	34	34			
560		34	34						

Temperature-°C

C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
56		21	21	21	21	21	21	21	21
100		21	21	21	21	21	21	21	21
180		21	21	21	21	21	21	21	21
320		21	21	21	21	21			
560		21	21						

aquatic bioassay & consulting laboratories, inc

CHRONIC ABALONE DEVELOPMENT BIOASSAY

DATE: 13 August 2014

STANDARD TOXICANT: Zinc

NOEC = 32.00 ug/l

EC25 = 42.20 ug/l
EC50 = 52.41 ug/l

Yours very truly,

Scott Johnson
Laboratory Director

CETIS Summary Report

Report Date: 08 Sep-14 15:39 (p 1 of 1)
Test Code: ABS081314 | 05-6394-4050

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	20-9249-7498	**Test Type:**	Development	**Analyst:**	
Start Date:	13 Aug-14 12:00	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	15 Aug-14 12:00	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	
Sample ID:	12-4187-7498	**Code:**	ABS081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 12:00	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
08-6554-3375	Proportion Normal	32	56	42.33	20.0%		Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
02-9141-9541	Proportion Normal	EC5	34.04	32.98	39.02		Linear Interpolation (ICPIN)
		EC10	36.08	33.96	46.03		
		EC15	38.12	34.94	53.05		
		EC20	40.16	35.92	60.06		
		EC25	42.2	36.9	65.11		
		EC40	48.33	39.84	74.81		
		EC50	52.41	41.8	81.27		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-9141-9541	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
08-6554-3375	Proportion Normal	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
08-6554-3375	Proportion Normal	NOEL	32	NL - 56	No	Passes Acceptability Criteria
08-6554-3375	Proportion Normal	PMSD	0.1996	NL - 0.2	No	Passes Acceptability Criteria

Proportion Normal Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
18		5	1	1	1	1	1	0	0	0.0%	0.0%
32		5	1	1	1	1	1	0	0	0.0%	0.0%
56		5	0.412	0	0.95	0	1	0.1938	0.4333	105.2%	58.8%
100		5	0	0	0	0	0	0	0		100.0%
180		5	0	0	0	0	0	0	0		100.0%

Proportion Normal Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
18		1	1	1	1	1
32		1	1	1	1	1
56		0.74	0.14	1	0.18	0
100		0	0	0	0	0
180		0	0	0	0	0

Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		74/100	14/100	100/100	18/100	0/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

CETIS Analytical Report

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	08-6554-3375	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:38	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	12-4187-7498	**Code:**	ABS081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 12:00	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	20.0%	32	56	42.33	

Steel Many-One Rank Sum Test

Control	vs	C-µg/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		18	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		32	27.5	17	1	8	0.7500	Asymp	Non-Significant Effect
		56*	17.5	17	1	8	0.0470	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.615482	0.8718275	3	10.13	0.0006	Significant Effect
Error	1.376565	0.08603531	16			
Total	3.992047		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	6.079	5.953	0.0093	Unequal Variances
Variances	Levene Equality of Variance	17.79	5.292	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.6826	0.866	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.4	0.2235	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	1.891	2.576	0.0587	Normal Distribution
Distribution	D'Agostino Kurtosis	3.025	2.576	0.0025	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	12.73	9.21	0.0017	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	3.725	3.878	<0.0001	Non-normal Distribution

Proportion Normal Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
18		5	1	1	1	1	1	1	0	0.0%	0.0%
32		5	1	1	1	1	1	1	0	0.0%	0.0%
56		5	0.412	0	0.95	0.18	0	1	0.1938	105.2%	58.8%
100		5	0	0	0	0	0	0	0		100.0%
180		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
18		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
32		5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%
56		5	0.6856	-0.04277	1.414	0.4381	0.05002	1.521	0.2624	85.56%	54.92%
100		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.71%
180		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.71%

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	08-6554-3375	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:38	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Proportion Normal Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
18		1	1	1	1	1
32		1	1	1	1	1
56		0.74	0.14	1	0.18	0
100		0	0	0	0	0
180		0	0	0	0	0

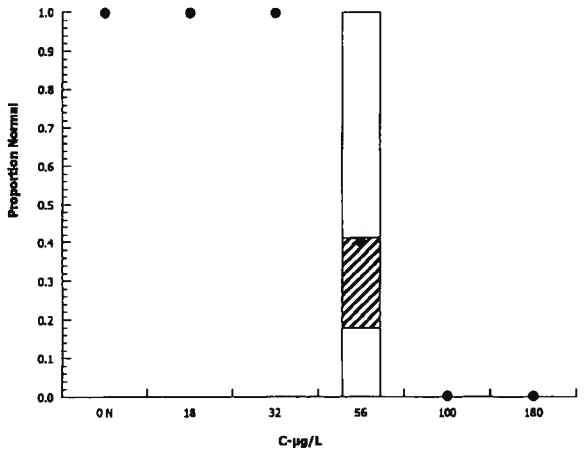
Angular (Corrected) Transformed Detail

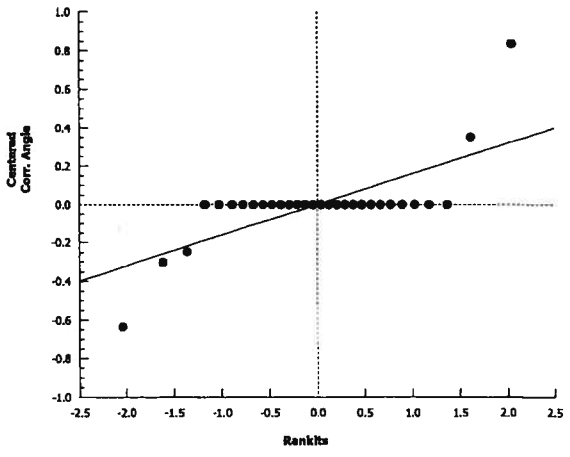
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.521	1.521	1.521	1.521	1.521
18		1.521	1.521	1.521	1.521	1.521
32		1.521	1.521	1.521	1.521	1.521
56		1.036	0.3835	1.521	0.4381	0.05002
100		0.05002	0.05002	0.05002	0.05002	0.05002
180		0.05002	0.05002	0.05002	0.05002	0.05002

Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		74/100	14/100	100/100	18/100	0/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

Graphics





CETIS Analytical Report

Test Code: ABS081314 | 05-6394-4050

Red Abalone Larval Development Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	02-9141-9541	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:38	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	12-4187-7498	**Code:**	ABS081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 12:00	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	34.04	32.98	39.02
EC10	36.08	33.96	46.03
EC15	38.12	34.94	53.05
EC20	40.16	35.92	60.06
EC25	42.2	36.9	65.11
EC40	48.33	39.84	74.81
EC50	52.41	41.8	81.27

Proportion Normal Summary

			Calculated Variate(A/B)								
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	500	500
18		5	1	1	1	0	0	0.0%	0.0%	500	500
32		5	1	1	1	0	0	0.0%	0.0%	500	500
56		5	0.412	0	1	0.1938	0.4333	105.2%	58.8%	206	500
100		5	0	0	0	0	0		100.0%	0	500
180		5	0	0	0	0	0		100.0%	0	500

Proportion Normal Detail

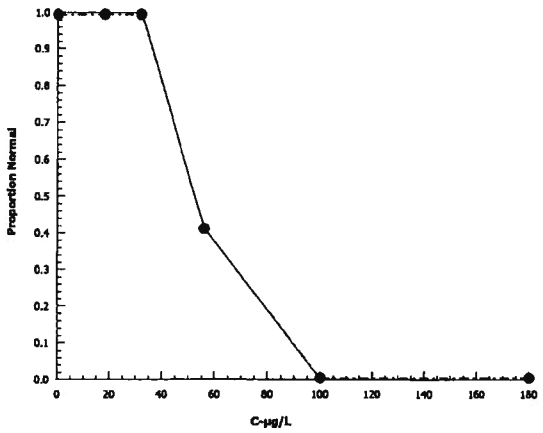
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
18		1	1	1	1	1
32		1	1	1	1	1
56		0.74	0.14	1	0.18	0
100		0	0	0	0	0
180		0	0	0	0	0

Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		74/100	14/100	100/100	18/100	0/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

Analysis ID:	02-9141-9541	**Endpoint:**	Proportion Normal	**CETIS Version:**	CETISv1.8.7
Analyzed:	08 Sep-14 15:38	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Measurement Report

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	20-9249-7498	**Test Type:**	Development	**Analyst:**	
Start Date:	13 Aug-14 12:00	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	15 Aug-14 12:00	**Species:**	Haliotis rufescens	**Brine:**	Not Applicable
Duration:	48h	**Source:**	Cultured Abalone	**Age:**	
Sample ID:	12-4187-7498	**Code:**	ABS081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 12:00	**Material:**	Zinc	**Project:**	REF TOX
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.3	14.5	14 - 16	Yes	Results Within Limits

Dissolved Oxygen-mg/L

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	5.9	-2.994	14.79	5.2	6.6	0.7	0.9899	16.78%	0
18		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
32		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
56		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
100		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
180		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
Overall		12	6.775			5.2	7				0 (0%)

pH-Units

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.4	7.389	7.411	7.4	7.4	0	0	0.0%	0
18		2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
32		2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
56		2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
100		2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
180		2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
Overall		12	7.483			7.4	7.5				0 (0%)

Salinity-ppt

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
18		2	34	34	34	34	34	0	0	0.0%	0
32		2	34	34	34	34	34	0	0	0.0%	0
56		2	34	34	34	34	34	0	0	0.0%	0
100		2	34	34	34	34	34	0	0	0.0%	0
180		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)

Temperature-°C

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
18		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
32		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
56		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
100		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
180		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
Overall		12	14.4			14.3	14.5				0 (0%)

Red Abalone Larval Development Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Dissolved Oxygen-mg/L

C-µg/L	Control Type	1	2
0	Negative Contr	6.6	5.2
18		7	6.9
32		7	6.9
56		7	6.9
100		7	6.9
180		7	6.9

pH-Units

C-µg/L	Control Type	1	2
0	Negative Contr	7.4	7.4
18		7.5	7.5
32		7.5	7.5
56		7.5	7.5
100		7.5	7.5
180		7.5	7.5

Salinity-ppt

C-µg/L	Control Type	1	2
0	Negative Contr	34	34
18		34	34
32		34	34
56		34	34
100		34	34
180		34	34

Temperature-°C

C-µg/L	Control Type	1	2
0	Negative Contr	14.5	14.3
18		14.5	14.3
32		14.5	14.3
56		14.5	14.3
100		14.5	14.3
180		14.5	14.3

aquatic bioassay & consulting laboratories, inc

CHRONIC KELP GERMINATION & GROWTH BIOASSAY

DATE: 13 August - 14

STANDARD TOXICANT: Copper Chloride

ENDPOINT: GERMINATION

NOEC = 100.00 ug/l

EC25 = 124.00 ug/l
EC50 = 148.20 ug/l

ENDPOINT: GROWTH-LENGTH

NOEC = 100.00 ug/l

IC25 = 122.10 ug/l
IC50 = 146.60 ug/l

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	05-7859-9980	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	13 Aug-14 14:00	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	15 Aug-14 14:00	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	David Gutoff	**Age:**	
Sample ID:	20-2922-8578	**Code:**	KLP081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 14:00	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
01-5185-8980	Germination Rate	100	180	134.2	22.3%		Steel Many-One Rank Sum Test
12-2672-2531	Mean Length	100	180	134.2	21.0%		Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	µg/L	95% LCL	95% UCL	TU	Method
18-2004-3903	Germination Rate	EC5	104.7	101.9	108.6		Linear Interpolation (ICPIN)
		EC10	109.5	105.9	118.8		
		EC15	114.4	109.5	129		
		EC20	119.2	113.2	139		
		EC25	124	116.8	149		
		EC40	138.6	127.8	179.2		
		EC50	148.2	135.1	202.1		
17-4183-9336	Mean Length	IC5	102.5	12.35	105.9		Linear Interpolation (ICPIN)
		IC10	107.4	100.4	112.6		
		IC15	112.3	105.3	121.3		
		IC20	117.2	109.5	131.2		
		IC25	122.1	113.9	140.9		
		IC40	136.8	125.7	170.3		
		IC50	146.6	133.5	190.2		

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
01-5185-8980	Germination Rate	Control Resp	0.914	0.7 - NL	Yes	Passes Acceptability Criteria
18-2004-3903	Germination Rate	Control Resp	0.914	0.7 - NL	Yes	Passes Acceptability Criteria
12-2672-2531	Mean Length	Control Resp	16.16	10 - NL	Yes	Passes Acceptability Criteria
17-4183-9336	Mean Length	Control Resp	16.16	10 - NL	Yes	Passes Acceptability Criteria
12-2672-2531	Mean Length	NOEL	100	NL - 35	No	Above Acceptability Criteria
01-5185-8980	Germination Rate	PMSD	0.223	NL - 0.2	No	Above Acceptability Criteria
12-2672-2531	Mean Length	PMSD	0.2096	NL - 0.2	No	Above Acceptability Criteria

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Germination Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.914	0.8883	0.9397	0.88	0.93	0.009274	0.02074	2.27%	0.0%
5.6		5	0.926	0.9052	0.9468	0.91	0.95	0.007483	0.01673	1.81%	-1.31%
10		5	0.918	0.8976	0.9384	0.9	0.94	0.007348	0.01643	1.79%	-0.44%
18		5	0.916	0.9049	0.9271	0.9	0.92	0.004	0.008944	0.98%	-0.22%
32		5	0.92	0.9004	0.9396	0.9	0.94	0.007071	0.01581	1.72%	-0.66%
100		5	0.92	0.8968	0.9432	0.9	0.95	0.008367	0.01871	2.03%	-0.66%
180		5	0.158	0	0.5967	0	0.79	0.158	0.3533	223.6%	82.71%
320		5	0	0	0	0	0	0	0		100.0%

Mean Length Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.16	15.68	16.64	15.7	16.5	0.172	0.3847	2.38%	0.0%
5.6		5	15.72	14.83	16.61	14.8	16.7	0.32	0.7155	4.55%	2.72%
10		5	15.6	15.27	15.93	15.3	16	0.1183	0.2646	1.7%	3.47%
18		5	15.98	15.44	16.52	15.6	16.5	0.196	0.4382	2.74%	1.11%
32		5	15.76	15.19	16.33	15.2	16.4	0.204	0.4561	2.89%	2.48%
100		5	15.8	14.72	16.88	14.4	16.5	0.3899	0.8718	5.52%	2.23%
180		5	2.56	-4.548	9.668	0	12.8	2.56	5.724	223.6%	84.16%
320		5	0	0	0	0	0	0	0		100.0%

Germination Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.92	0.93	0.88	0.93	0.91
5.6		0.93	0.95	0.91	0.93	0.91
10		0.94	0.9	0.91	0.93	0.91
18		0.92	0.92	0.9	0.92	0.92
32		0.93	0.91	0.92	0.94	0.9
100		0.91	0.9	0.92	0.95	0.92
180		0.79	0	0	0	0
320		0	0	0	0	0

Mean Length Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.8	16.3	16.5	16.5	15.7
5.6		15.5	15.5	16.7	16.1	14.8
10		15.5	15.3	16	15.5	15.7
18		15.8	16.5	16.4	15.6	15.6
32		15.6	16.4	16	15.6	15.2
100		16.3	16.5	14.4	15.5	16.3
180		12.8	0	0	0	0
320		0	0	0	0	0

Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	88/100	93/100	91/100
5.6		93/100	95/100	91/100	93/100	91/100
10		94/100	90/100	91/100	93/100	91/100
18		92/100	92/100	90/100	92/100	92/100
32		93/100	91/100	92/100	94/100	90/100
100		91/100	90/100	92/100	95/100	92/100
180		79/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

CETIS Analytical Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	01-5185-8980	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	20-2922-8578	**Code:**	KLP081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 14:00	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	22.3%	100	180	134.2	

Steel Many-One Rank Sum Test

Control	vs	C-µg/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		5.6	31	16	3	8	0.9749	Asymp	Non-Significant Effect
		10	28	16	3	8	0.8838	Asymp	Non-Significant Effect
		18	26	16	1	8	0.7547	Asymp	Non-Significant Effect
		32	29	16	4	8	0.9262	Asymp	Non-Significant Effect
		100	27.5	16	2	8	0.8571	Asymp	Non-Significant Effect
		180*	15	16	0	8	0.0222	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.499707	0.7499512	6	23.43	<0.0001	Significant Effect
Error	0.896039	0.03200139	28			
Total	5.395746		34			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	72.69	16.81	<0.0001	Unequal Variances
Variances	Mod Levene Equality of Variance	0.8125	3.812	0.5721	Equal Variances
Variances	Levene Equality of Variance	6.068	3.528	0.0004	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.5071	0.9146	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.3282	0.1723	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	5.921	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino Kurtosis	5.144	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	61.51	9.21	<0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	5.997	3.878	<0.0001	Non-normal Distribution

Germination Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.914	0.8883	0.9397	0.92	0.88	0.93	0.009273	2.27%	0.0%
5.6		5	0.926	0.9052	0.9468	0.93	0.91	0.95	0.007483	1.81%	-1.31%
10		5	0.918	0.8976	0.9384	0.91	0.9	0.94	0.007348	1.79%	-0.44%
18		5	0.916	0.9049	0.9271	0.92	0.9	0.92	0.004	0.98%	-0.22%
32		5	0.92	0.9004	0.9396	0.92	0.9	0.94	0.007071	1.72%	-0.66%
100		5	0.92	0.8968	0.9432	0.92	0.9	0.95	0.008366	2.03%	-0.66%
180		5	0.158	0	0.5967	0	0	0.79	0.158	223.6%	82.71%
320		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.275	1.23	1.319	1.284	1.217	1.303	0.01595	2.8%	0.0%
5.6		5	1.297	1.256	1.337	1.303	1.266	1.345	0.01468	2.53%	-1.73%
10		5	1.282	1.244	1.319	1.266	1.249	1.323	0.01368	2.39%	-0.54%
18		5	1.277	1.258	1.296	1.284	1.249	1.284	0.006999	1.23%	-0.19%
32		5	1.285	1.249	1.322	1.284	1.249	1.323	0.01312	2.28%	-0.82%
100		5	1.286	1.241	1.331	1.284	1.249	1.345	0.01625	2.83%	-0.87%
180		5	0.259	-0.3212	0.8391	0.05002	0.05002	1.095	0.2089	180.4%	79.68%
320		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	0	0.0%	96.08%

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	01-5185-8980	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Germination Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.92	0.93	0.88	0.93	0.91
5.6		0.93	0.95	0.91	0.93	0.91
10		0.94	0.9	0.91	0.93	0.91
18		0.92	0.92	0.9	0.92	0.92
32		0.93	0.91	0.92	0.94	0.9
100		0.91	0.9	0.92	0.95	0.92
180		0.79	0	0	0	0
320		0	0	0	0	0

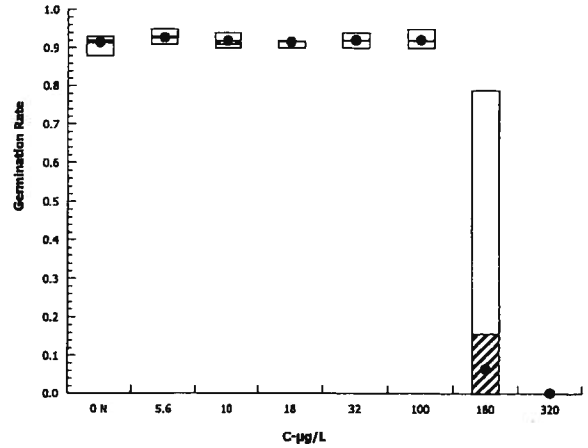
Angular (Corrected) Transformed Detail

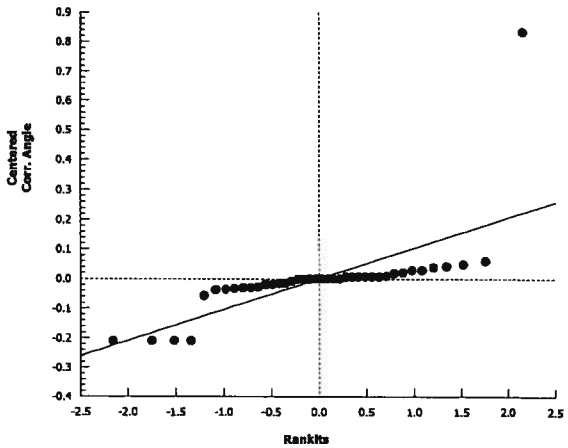
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.284	1.303	1.217	1.303	1.266
5.6		1.303	1.345	1.266	1.303	1.266
10		1.323	1.249	1.266	1.303	1.266
18		1.284	1.284	1.249	1.284	1.284
32		1.303	1.266	1.284	1.323	1.249
100		1.266	1.249	1.284	1.345	1.284
180		1.095	0.05002	0.05002	0.05002	0.05002
320		0.05002	0.05002	0.05002	0.05002	0.05002

Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	88/100	93/100	91/100
5.6		93/100	95/100	91/100	93/100	91/100
10		94/100	90/100	91/100	93/100	91/100
18		92/100	92/100	90/100	92/100	92/100
32		93/100	91/100	92/100	94/100	90/100
100		91/100	90/100	92/100	95/100	92/100
180		79/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

Graphics





Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	12-2672-2531	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Sample ID:	20-2922-8578	**Code:**	KLP081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 14:00	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	21.0%	100	180	134.2	

Steel Many-One Rank Sum Test

Control	vs	C-µg/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		5.6	22	16	0	8	0.3786	Asymp	Non-Significant Effect
		10	17.5	16	1	8	0.0792	Asymp	Non-Significant Effect
		18	23.5	16	3	8	0.5252	Asymp	Non-Significant Effect
		32	20	16	0	8	0.2114	Asymp	Non-Significant Effect
		100	24	16	3	8	0.5746	Asymp	Non-Significant Effect
		180*	15	16	0	8	0.0222	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	756.452	126.0753	6	25.46	<0.0001	Significant Effect
Error	138.632	4.951143	28			
Total	895.084		34			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	60.05	16.81	<0.0001	Unequal Variances
Variances	Mod Levene Equality of Variance	0.7287	3.812	0.6317	Equal Variances
Variances	Levene Equality of Variance	5.618	3.528	0.0006	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.5609	0.9146	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.3073	0.1723	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	5.785	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino Kurtosis	5.06	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	59.06	9.21	<0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	4.801	3.878	<0.0001	Non-normal Distribution

Mean Length Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	16.16	15.68	16.64	16.3	15.7	16.5	0.172	2.38%	0.0%
5.6		5	15.72	14.83	16.61	15.5	14.8	16.7	0.32	4.55%	2.72%
10		5	15.6	15.27	15.93	15.5	15.3	16	0.1183	1.7%	3.47%
18		5	15.98	15.44	16.52	15.8	15.6	16.5	0.196	2.74%	1.11%
32		5	15.76	15.19	16.33	15.6	15.2	16.4	0.204	2.89%	2.48%
100		5	15.8	14.72	16.88	16.3	14.4	16.5	0.3899	5.52%	2.23%
180		5	2.56	-4.548	9.668	0	0	12.8	2.56	223.6%	84.16%
320		5	0	0	0	0	0	0	0		100.0%

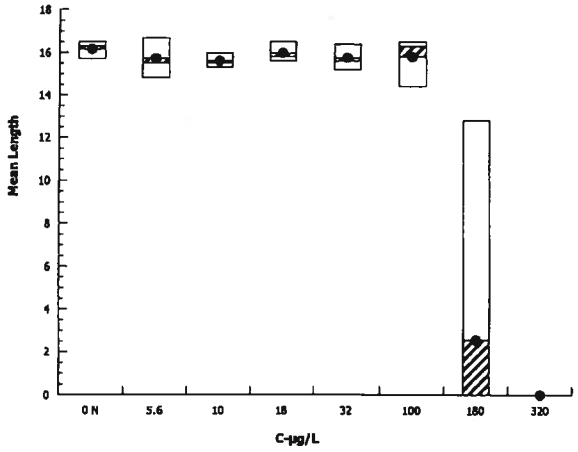
Mean Length Detail

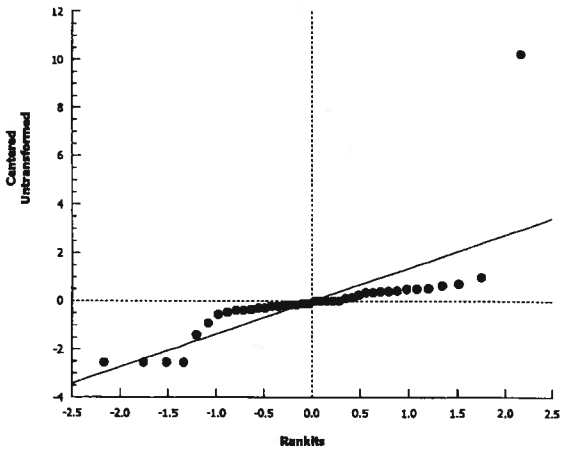
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.8	16.3	16.5	16.5	15.7
5.6		15.5	15.5	16.7	16.1	14.8
10		15.5	15.3	16	15.5	15.7
18		15.8	16.5	16.4	15.6	15.6
32		15.6	16.4	16	15.6	15.2
100		16.3	16.5	14.4	15.5	16.3
180		12.8	0	0	0	0
320		0	0	0	0	0

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	12-2672-2531	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	18-2004-3903	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	20-2922-8578	**Code:**	KLP081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 14:00	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
EC5	104.7	101.9	108.6
EC10	109.5	105.9	118.8
EC15	114.4	109.5	129
EC20	119.2	113.2	139
EC25	124	116.8	149
EC40	138.6	127.8	179.2
EC50	148.2	135.1	202.1

Germination Rate Summary

			Calculated Variate(A/B)								
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.914	0.88	0.93	0.009273	0.02074	2.27%	0.0%	457	500
5.6		5	0.926	0.91	0.95	0.007483	0.01673	1.81%	-1.31%	463	500
10		5	0.918	0.9	0.94	0.007348	0.01643	1.79%	-0.44%	459	500
18		5	0.916	0.9	0.92	0.004	0.008944	0.98%	-0.22%	458	500
32		5	0.92	0.9	0.94	0.007071	0.01581	1.72%	-0.66%	460	500
100		5	0.92	0.9	0.95	0.008366	0.01871	2.03%	-0.66%	460	500
180		5	0.158	0	0.79	0.158	0.3533	223.6%	82.71%	79	500
320		5	0	0	0	0	0		100.0%	0	500

Germination Rate Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.92	0.93	0.88	0.93	0.91
5.6		0.93	0.95	0.91	0.93	0.91
10		0.94	0.9	0.91	0.93	0.91
18		0.92	0.92	0.9	0.92	0.92
32		0.93	0.91	0.92	0.94	0.9
100		0.91	0.9	0.92	0.95	0.92
180		0.79	0	0	0	0
320		0	0	0	0	0

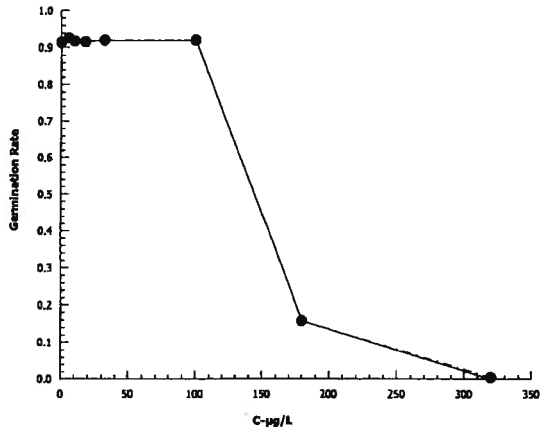
Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	88/100	93/100	91/100
5.6		93/100	95/100	91/100	93/100	91/100
10		94/100	90/100	91/100	93/100	91/100
18		92/100	92/100	90/100	92/100	92/100
32		93/100	91/100	92/100	94/100	90/100
100		91/100	90/100	92/100	95/100	92/100
180		79/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	18-2004-3903	**Endpoint:**	Germination Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-4183-9336	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Sample ID:	20-2922-8578	**Code:**	KLP081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 14:00	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	855619	280	Yes	Two-Point Interpolation

Point Estimates

Level	µg/L	95% LCL	95% UCL
IC5	102.5	12.35	105.9
IC10	107.4	100.4	112.6
IC15	112.3	105.3	121.3
IC20	117.2	109.5	131.2
IC25	122.1	113.9	140.9
IC40	136.8	125.7	170.3
IC50	146.6	133.5	190.2

Mean Length Summary

			Calculated Variate						
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.16	15.7	16.5	0.172	0.3847	2.38%	0.0%
5.6		5	15.72	14.8	16.7	0.32	0.7155	4.55%	2.72%
10		5	15.6	15.3	16	0.1183	0.2646	1.7%	3.47%
18		5	15.98	15.6	16.5	0.196	0.4382	2.74%	1.11%
32		5	15.76	15.2	16.4	0.204	0.4561	2.89%	2.48%
100		5	15.8	14.4	16.5	0.3899	0.8718	5.52%	2.23%
180		5	2.56	0	12.8	2.56	5.724	223.6%	84.16%
320		5	0	0	0	0	0		100.0%

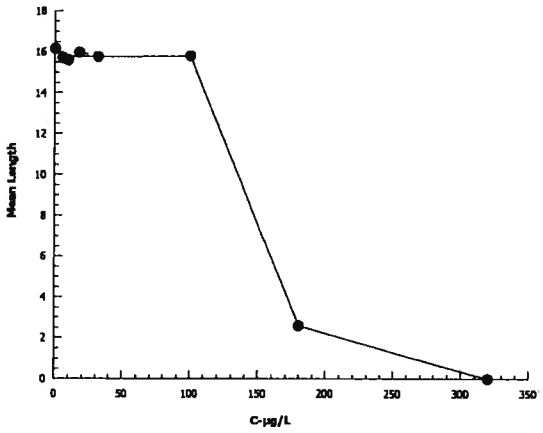
Mean Length Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.8	16.3	16.5	16.5	15.7
5.6		15.5	15.5	16.7	16.1	14.8
10		15.5	15.3	16	15.5	15.7
18		15.8	16.5	16.4	15.6	15.6
32		15.6	16.4	16	15.6	15.2
100		16.3	16.5	14.4	15.5	16.3
180		12.8	0	0	0	0
320		0	0	0	0	0

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Analysis ID:	17-4183-9336	**Endpoint:**	Mean Length	**CETIS Version:**	CETISv1.8.7
Analyzed:	09 Sep-14 14:23	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Measurement Report

Macrocystis Germination and Germ Tube Growth Test — **Aquatic Bioassay & Consulting Labs, Inc.**

Batch ID:	05-7859-9980	**Test Type:**	Growth-Germination	**Analyst:**	
Start Date:	13 Aug-14 14:00	**Protocol:**	EPA/600/R-95/136 (1995)	**Diluent:**	Laboratory Seawater
Ending Date:	15 Aug-14 14:00	**Species:**	Macrocystis pyrifera	**Brine:**	Not Applicable
Duration:	48h	**Source:**	David Gutoff	**Age:**	
Sample ID:	20-2922-8578	**Code:**	KLP081314	**Client:**	Internal Lab
Sample Date:	13 Aug-14 14:00	**Material:**	Copper chloride	**Project:**	
Receive Date:		**Source:**	Reference Toxicant		
Sample Age:	NA	**Station:**	REF TOX		

Dissolved Oxygen-mg/L

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
5.6		2	6.15	5.515	6.785	6.1	6.2	0.05001	0.07072	1.15%	0
10		2	6.4	5.129	7.671	6.3	6.5	0.1	0.1414	2.21%	0
18		2	6.4	2.588	10.21	6.1	6.7	0.3	0.4243	6.63%	0
32		2	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
100		2	6.35	1.903	10.8	6	6.7	0.35	0.495	7.8%	0
180		2	6.4	0.0469	12.75	5.9	6.9	0.5	0.7071	11.05%	0
320		2	6.35	0.6322	12.07	5.9	6.8	0.45	0.6364	10.02%	0
Overall		16	6.356			5.9	6.9				0 (0%)

pH-Units

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
5.6		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
10		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
18		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
32		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
100		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
180		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
320		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
Overall		16	7.9			7.9	7.9				0 (0%)

Salinity-ppt

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
5.6		2	34	34	34	34	34	0	0	0.0%	0
10		2	34	34	34	34	34	0	0	0.0%	0
18		2	34	34	34	34	34	0	0	0.0%	0
32		2	34	34	34	34	34	0	0	0.0%	0
100		2	34	34	34	34	34	0	0	0.0%	0
180		2	34	34	34	34	34	0	0	0.0%	0
320		2	34	34	34	34	34	0	0	0.0%	0
Overall		16	34			34	34				0 (0%)

Temperature-°C

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
5.6		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
10		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
18		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
32		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
180		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
320		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
Overall		16	14.75			14.7	14.8				0 (0%)

Macrocystis Germination and Germ Tube Growth Test Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-µg/L	Control Type	1	2
0	Negative Contr	6.8	6
5.6		6.2	6.1
10		6.5	6.3
18		6.7	6.1
32		6.8	6
100		6.7	6
180		6.9	5.9
320		6.8	5.9

pH-Units

C-µg/L	Control Type	1	2
0	Negative Contr	7.9	7.9
5.6		7.9	7.9
10		7.9	7.9
18		7.9	7.9
32		7.9	7.9
100		7.9	7.9
180		7.9	7.9
320		7.9	7.9

Salinity-ppt

C-µg/L	Control Type	1	2
0	Negative Contr	34	34
5.6		34	34
10		34	34
18		34	34
32		34	34
100		34	34
180		34	34
320		34	34

Temperature-°C

C-µg/L	Control Type	1	2
0	Negative Contr	14.7	14.8
5.6		14.7	14.8
10		14.7	14.8
18		14.7	14.8
32		14.7	14.8
100		14.7	14.8
180		14.7	14.8
320		14.7	14.8

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport McMoRan O&G
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: August 14, 2014
Laboratory Number: 142038
Project Name: PF Hermosa Monthly NPDES Produced Water Monitoring
Sampled by: Client

On August 7, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
NPDES PROD. WATER	142038-01
OCEAN WATER @-FIRE WATER PUMPS	142038-02

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa @ Orcutt
Mike Apple @-EDT
Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 2 pages excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)
CAS LAB NO: 142038
Analyst: AN

Date Sampled: 08/06/14
Date Received: 08/07/14
Sample Matrix: Water

WET CHEMISTRY SUMMARY

COMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
CAS Lab#: 142038-01							
Sample ID: NPDES Prod. Water							
Dissolved Sulfide	150	mg/L	1	0.2	0.04	4500S^{-2}F	08/14/14
CAS Lab#: 142038-02							
Sample ID: Ocean Water @-Fire Water Pumps							
Spec. Conductivity	51300	µS/cm	1	1	---	120.1	08/07/14

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

QUALITY CONTROL SECTION

Sample ID: Method Blank
CAS LAB NO: 142038-MB

Analyst: AN

WET CHEMISTRY SUMMARY

CPMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
Dissolved Sulfide	ND	mg/L	1	0.2	0.04	4500S^{-2}F	08/14/14

DF: Dilution Factor
mg/L: Milligrams/Liter(ppm)
ND: Not Detected

142038

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** FM O&G c/o LTS, 704 Adirondack Ave Ventura, CA 93003	**Bill to:** FM O&G 700 Milam, Ste. 3100 Houston, Tx 77002

8/14

8/15

FACILITY: Platform Hermosa
COLLECTOR: LTS /
PROJECT/CHARGE #: Monthly NPDES Produced Water Monitoring
RESULTS REQUIRED: normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: S.G. Lawry @ LTS PHONE: 644-4560
COPIES TO: Platform Supervisor (201 S Broadway, Orcutt)
Ruth Juris (email) PHONE: _____

SAMPLE NO.	SAMPLE ID	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	PRESERV.	ANALYSES REQUESTED (METHOD)
1	NPDES Prod.Water	grab	500 mL plastic	8/6/2014 1648	NaOH-Zn	**Dissolved Sulfides** (Method SM4500S-2F) MDL: 20 ug/L (Dissolved sulfides were preserved & filtered in the field prior to submittal)
2	Ocean Water @ Fire Water pumps	grab		8/6/2014 1715	kc	**Conductivity**
						Field notes:
						130 ppm field Sulfides
						19K H2S

Comments:
Capco: Please report MDLs and PQLs on lab report

Relinquished by:	Date: 8.7.14
Received by:	Time: 1315

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport McMoRan O&G
C/O: LTS environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: September 15, 2014
Laboratory Number: 142331
Project Name: PF Hermosa Monthly NPDES Produced Water Monitoring
Sampled by: Client

On September 11, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
NPDES PROD. WATER	142331-01
OCEAN WATER @ FIRE WATER PUMPS	142331-02

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa Supervisor @-Orcutt
Mike Apple @-EDT
Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 2 pages excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)
CAS LAB NO: 142331
Analyst: AN

Date Sampled: 09/08/14
Date Received: 09/11/14
Sample Matrix: Water

WET CHEMISTRY SUMMARY

COMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
CAS Lab#: 142331-01							
Sample ID: NPDES Prod. Water							
Dissolved Sulfide	125	mg/L	1	0.2	0.04	4500S^{-2}F	09/12/14
CAS Lab#: 142331-02							
Sample ID: Ocean Water @-Fire Water Pumps							
Spec. Conductivity	51600	µS/cm	1	1	---	120.1	09/11/14

1536 Eastman Ave. Suite B, Ventura, California 93003 Ph: (805)644-1095 FAX: (805)644-9947
www.capcoenv.com

QUALITY CONTROL SECTION

Sample ID: Method Blank
CAS LAB NO: 142331-MB

Analyst: AN

WET CHEMISTRY SUMMARY

CPMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
Dissolved Sulfide	ND	mg/L	1	0.2	0.04	4500S^{-2}F	09/12/14

DF: Dilution Factor
mg/L: Milligrams/Liter(ppm)
ND: Not Detected

142331

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	**Report to:** c/o	Freeport McMoRan O&G LTS, 704 Adirondack Ave Ventura, CA 93003	**Bill to:**	Freeport McMoRan O&G 700 Milam, Ste. 3100 Houston, Tx 77002

FACILITY: Platform Hermosa
COLLECTOR: LTS /
PROJECT/CHARGE #: Monthly NPDES Produced Water Monitoring
RESULTS REQUIRED: normal
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: S.G. Lawry @ LTS PHONE: 644-4560
COPIES TO: Platform Supervisor (201 S Broadway, Orcutt)
Ruth Juris (email) PHONE: _____

9/18 9/19

SAMPLE NO.	SAMPLE ID	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	PRESERV.	ANALYSES REQUESTED (METHOD)
1	NPDES Prod.Water	grab	500 mL plastic	9.8.14 2130	NaOH-Zn	**Dissolved Sulfides** (Method SM4500S-2F) MDL: 20 ug/L (Dissolved sulfides were preserved & filtered in the field prior to submittal)
2	Ocean Water @ Fire Water pumps	grab		9.9.14 630	Ice	**Conductivity**
						19.5 k (H2S)
						130 ppm sulfides via field test

Comments:

Capco: Please report MDLs and PQLs on lab report

Relinquished by:	Date: 9.11.14
Received by:	Time: 845

Relinquished by:	Date: 09/11/14
Received by:	Time: 8:50

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas
C/O: LTS Environmental, Inc.
704 Adirondack Avenue
Ventura, CA 93003
Attn: Steve Lawry

Report Date: October 14, 2014
Laboratory Number: 142567
Project Name: PF Hermosa Dissolved Sulfides
Sampled By: Client

On October 8, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
V-97 NON-NPDES	142567-01
UNICEL OUT NPDES	142567-02

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.
Director - Analytical Operations

cc: PF Hermosa Supervisor
Mike Apple-EDT
Ruth Juris-EDT

If you have any further questions or concerns, please contact me at your convenience.
This report consists of 2 pages excluding the cover letter and the Chain of Custody.

CAPCO
Analytical Services, Inc.

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa)
CAS LAB NO: 142567
Analyzed By: AN

Date Sampled: 10/07/14
Date Received: 10/08/14
Date Analyzed: 10/09/14
Sample Matrix: Water

DISSOLVED SULFIDE
EPA METHOD 4500S^{-2}F

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142567-02	Unicel Out NPDES	120	1	0.04	0.2

QUALITY CONTROL DATA

142567-MB	Method Blank	ND	1	0.04	0.2

mg/L: Milligrams/Liter(ppm)
DF: Dilution Factor

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report to FM O&G s c/o S. Lawry	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002

FACILITY: Hermosa
COLLECTOR: LTS
PROJECT/CHARGE #: ~~non-NPDES samples~~ Dissolved Sulfide RH
RESULTS REQUIRED: 48 hour/Hold
RESULTS BY: PHONE: _____ FAX: _____

SUBMITTED TO: Capco Analytical Services
REPORT TO: _____ PHONE: _____
COPIES TO: Platform Supervisor PHONE: 644-4560
201 S. Broadway, PHONE: _____
Orcutt, CA 93455
Ruth Juris

10/10

SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-serv	ANALYSES REQUESTED (METHOD)
1	V-97-non/NPDES RH	grab	1	Date: 10/7/14 Time: 1700	NaOH Zn	Dissolved Sulfides 142567
2	Unicel out NPDES RH	grab	1	1705	NaOH Zn	HOLD Call LTS with results for #1 first.
						Field notes
						Field floculation
						New Diffuser on line.
						26 K. H2S. Need to order more reagent for the field
						sulfides test.

Comments: **Run #1. Hold rest.**

Relinquished by:	Date: 10-8-14
Received by:	Time: 1515

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Relinquished by:	Date:
Received by:	Time:

Attachment 7

EPA Letter

FREEPORT-MCMORAN OIL & GAS

Freeport-McMoRan Oil & Gas
201 S. Broadway
Orcutt, CA 93455

Telephone: 805-934-8200

September 29, 2014

Mr. Eugene Bromley
EPA Region IX, Water Division
75 Hawthorne Street
San Francisco, CA 94105

Re: Hermosa Exceedance – Upset Condition

Dear Mr. Bromley:

This letter is in follow-up to a telephone message left for you on September 25, 2014 by Ruth Juris regarding an exceedance of the oil and grease limit for produced water discharges at Platform Hermosa. Ms. Juris reported this within 24 hours of receipt of a lab report on a produced water sample that was taken on September 18, 2014. The lab reported oil and grease results (method 1664) at 64 ppm.

It is believed that the well B-1 on Hermosa was the cause of the upset condition that resulted in this exceedance. Prior to the sampling, pressure swings and slightly elevated turbidity readings were noticed, which led operations to investigate the wells. At that time it was discovered that well B-1 was heading, causing erratic flow rates into the production separators that in-turn, caused a minor upset condition in the produced water treatment system. Operations were able to make adjustments to bring the well back under control and resolve the upset condition.

At no time did this situation present a hazard to human health or the environment.

Should you have any questions, please contact me at (805) 934-8220.

Sincerely,

David Rose
Environmental, Health & Safety
Manager